1507/1447

THE
INSTRUCTOR:
OR,
Young Man's Beſt Companion.

CONTAINING,

Spelling, Reading, Writing, and Arithmetick, in an eaſier Way than any yet publiſhed; and how to qualify any Perſon for Buſineſs, without the Help of a Maſter.

Inſtructions to write Variety of Hands, with Copies both in Proſe and Verſe. How to write Letters on Buſineſs or Friendſhip. Forms of Indentures, Bonds, Bills of Sale, Receipts, Wills, Leaſes, Releaſes, *&c.*

Alſo Merchants Accompts, and a ſhort and eaſy Method of Shop and Book-keeping; with a Deſcription of the Product, Counties and Market-Towns in *England* and *Wales.*

Together with the *Carpenter*'s Plain and Exact Rule: Shewing how to meaſure *Carpenters, Joiners, Sawyers, Bricklayers, Plaiſterers, Plumbers, Maſons, Glaſiers* and *Painters* Work. How to undertake each Work, and at what Price; the Rates of each Commodity, and the common Wages of Journeymen; with *Gunter*'s Line, and *Coggeſhall*'s Deſcription of the *Sliding-Rule.*

Likewiſe the PRACTICAL GAUGER made Eaſy; the Art of *Dialling,* and how to erect and fix any *Dial*; with Inſtructions *Dying, Colouring,* and making *Colours*; and ſome General Obſervations for *Gardening* every Month in the Year.

To which is added,

The FAMILY'S BEST COMPANION:

With Inſtructions for *Marking* on *Linnen*; how to *Pickle* and *Preſerve*; to make divers ſorts of Wine; and many *excellent Plaiſters,* and *Medicines,* neceſſary in all *Families*:

And

A COMPLEAT TREATISE of FARRIERY;

Or, Good Advice to GENTLEMEN and FARMERS; with a choice Collection of Remedies, very fit for all Farriers and Grooms.

Alſo ſome uſeful INTEREST-TABLES.

By *GEORGE FISHER,* Accomptant.

The Tenth Edition Reviſed and Corrected.

LONDON: Printed for J. HODGES, at the *Looking-Glaſs,* over-againſt *St. Magnus* Church, *London-Bridge,*
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In my beginning
may the Almighty powers
Blessing bestow in never-
ceasing showers.

Let me O God my labour
to employ,
That I a Competency may
enjoy.

30 MAY 65

If any one this book should fin
in Fields, or in Park,
Restore it to me, for you mae s
that in it is my mark.

William Cook of Wa
in the County of
Lincoln.

Thompson
Swanland
Hole

[redacted]

THE

PREFACE.

I *Need ſay but little by way of Preface, in relation to the Uſefulneſs of this Book, the Title Page ſo fully declaring its Contents: But as a Preface is uſually expected, I muſt and cannot well avoid ſaying ſomething with reſpect to its Utility.*

As to the firſt Step of forming the young Man's Mind for Buſineſs, viz. *The being inſtructed in, and acquainted with our Mother Tongue,* viz. Engliſh, *it muſt and is acknowledged by all, to be a due and principal Qualification in writing Buſineſs, and therefore it is neceſſary to be therewith well acquainted.*

Then in the next Place, to write a good fair, free, and commendable Hand, is as neceſſary in moſt, if not in all the Affairs of Life, and Occurrences of Buſineſs.

The next Thing touched on, is in relation to the inditing of ſome few Epiſtles or Letters in a familiar Stile, and on ſundry Subjects and Occaſions: With Directions how to ſubſcribe or conclude a Letter, and alſo to ſuperſcribe or direct Letters, according to the different Ranks and Qualities of the Perſons to whom directed: And this cannot be denied but to be a Qualification fit for a young Man, and alſo to others of more adult Years.

The next Accompliſhment for a young Man, and largely treated on in this Book, is that excellent Science of Arithmetick, *both Vulgar and Decimal: Leading him by the Hand, and by eaſy Steps, through its whole Courſe.*

Again, the young Man is next ſhewn the ingenious Art of Book-keeping after the Italian *Manner, by way of Double Entry; and that is an Accompliſhment that capacitates him for Buſineſs in the higheſt Degree: Under which Head, he is alſo informed how to draw out, or make various ſorts of Accompts or Writings relating to Mercantile Affairs; as Bills of Lading, Invoices, Accompts of Sales, together with Authentick Examples of Bills of Exchange, with Notes concerning them; likewiſe Bills of Parcels of divers Kinds; alſo various ſorts of Receipts,* &c. *All which is expedient for a young Man to know and underſtand, if he would be dexterous in Buſineſs.*

The young Man is here alſo inſtructed in relation to the Affairs of Buſineſs at the Water-ſide, as to Shipping off and Landing Goods, &c.

Next he hath a Deſcription of England *and* Wales, *each County being particularly ſpoken of, with reſpect to its Product, Soil, and Extent, and likewiſe the Names of its ſeveral Market-Towns.*

Here are alſo, eaſy, plain, and likewiſe curious Directions for Meaſuring all ſorts of Planes and Solids (Arithmetically and Inſtrumentally) as the Works of Carpenters, Joiners, Sawyers, Bricklayers, Maſons, Plaiſterers, Painters, Glaſiers, &c. *with the Prices of their Works.*

Here is likewiſe ſhewn the Methods of extracting the Square and Cube Roots, with ſome of their Uſes, in relation to Meaſuring, &c.

Alſo, Practical Gauging of divers Kinds of Veſſels, Tuns, &c. *Likewiſe Dialling in various Kinds, with the Repreſentation of ſeveral ſorts of Dials, and how to beautify and adorn them.*

Next are Precedents of Law Writings, as Bonds, Bills, Indentures, Wills, Letters of Attorney, &c.

Laſtly, ſome Directions relating to the pleaſant and delightful Art of Gardening, with general Obſervations for every Month in the Year. To which is ſubjoined, ſome Inſtructions to young Women how to Pickle and Preſerve all Kinds of Fruits and Flowers, &c. *with Inſtructions for making divers ſorts of Wines of* Engliſh *Growth; and alſo for preparing many excellent Medicines, Plaiſters,* &c. *with ſeveral good Preſcriptions of proper Uſe, againſt moſt Diſtempers: Fit for, and neceſſary in all Families.*

To the whole is now added a compleat Treatiſe of Farriery, being a ſure Guide to all Gentlemen and Farmers, in relation to the Care and Management of their Horſes, Mares, &c. *with proper Advice and Directions to a Groom, fully and plainly ſetting forth the beſt Methods of bringing up a good Horſe,* &c. *from the Time of his being foaled; ſo that he may anſwer every End expected from him. In this Treatiſe are included many excellent Receipts for the Cure of every Diſtemper incident to Horſes and Mares, more eſpecially to thoſe which have not been properly or carefully brought up.*

Alſo conciſe Tables to denote the Value of Portugal Pieces; *to buy or ſell by the Great Hundred; and to ſhew the Intereſt of any Sum at* 3, 4, *and* 5 per Cent.

THE
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OR,
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30 MAY 65

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INSTRUCTIONS
FOR
YOUTH,
TO SPELL, READ, and WRITE
TRUE ENGLISH.

The Uſe of Great and Small Letters; *how to divide them into Vowels and Conſonants; what Diphthongs are, their Numbers, and how pronounced and written.*

THE Subject Part of this Book being to inſtruct Young (as well as old) People, in the general Rules of Buſineſs and Converſation thereunto belonging, the firſt Step I ſhall take for forming the Mind for Buſineſs, is that moſt neceſſary Accompliſhment, the Spelling and Writing good and proper *Engliſh*; for let a Perſon write never ſo good a Hand, yet if he be defective in Spelling, he will be ridiculed and comtemptibly ſmiled at, notwithſtanding his fair Writing; and which will indeed, make his Orthographical Faults be more conſpicuous. But to the Matter.

Firſt, We are to take notice, that of Letters are made Syllables, of Syllables Words, and of Words, Sentences, *&c.*

The Letters are in Number 24; to which if you add *j* and *v* Conſonants, being of a different Shape and Sound from the reſt, they make 26. As to the Letters, we are to obſerve their Names, their Form, and their Force: Their Names, whereby to know them, their Form, whether great or ſmall; and their Force, in Pronunciation or Utterance.

Letters are diſtinguiſhed acccording to their Sound, into Vowels and Conſonants: A *Vowel* is a Letter that ſoundeth by itſelf, and they be five in Number, *viz.* *a*, *e*, *i*, *o*, *u*, and *y* the *Greek* Vowel; which alſo, is a Vowel *Engliſh*, when it cometh after a Conſonant, and hath the Sound of *i*; as in *by*, *ſly*, *reply*, &c. A *Conſonant* is a Letter that ſoundeth not except it be joined with a *Vowel*, for without one of the Vowels no Syllable can be made; as *b*, *c*, *d*, *&c.* without the Aid of a *Vowel*, make nothing: So that *Vowels* and *Conſonants* may be compared to *Nouns Subſtantive* and *Nouns Adjective*, each requiring the other's Aſſiſtance. Though we have but 24 Letters, and 6 of 'em *Vowels*, yet we have 21 *Conſonants*; for *j*, *v*, and *y*, when they are ſet before any *Vowel* in the ſame Syllable, become *Conſonants*; as was ſaid before concerning *y*; as in *Jupiter*, *Juno*, *Jilt*, *vulgar*, *violent*, *vigour*, &c. *Note*, That *j* Conſonant hath the Sound of *g*, as in *join*, *jangle*, *jingle*, &c.

When two *Vowels* come or meet together in a Word, and are not parted in the Pronunciation, but united in one Sound, ſuch are called *Diphthongs*; being 13, *viz.* *ai*, *ei*, *oi*, and *ui*, *au*, *eu*, *ou*, *oo*, *ea*, *eo*, *oa*, and *ei*; as in *maid*, *faith*, *either*, *join*, *aul*, *eunuch*, *ſtout*, *feed*, *ſeed*, *food*, *brood*, *ſtealth*, *wealth*, *people*, *ſteeple*, *boat*, *goat*, *heat*, *beat*, *feat*, *friend*, *field*, &c. *Note*, That in the firſt 7 Words, both *Vowels* are ſounded; but in the other 15, one of them is ſcarcely heard.

There are alſo thoſe that are called *Triphthongs*, where three *Vowels* meet in one Sound; as in *Beauty*, *Beau*, *Lieu*, and *View*: Likewiſe *ay*, *ey*, *oy*, *uy*; *aw*, *ew*, and *ow* become *Diphthongs* at the End of Words, but are called *improper Diphthongs*; as in *ſay*, *key*, *joy*, *ſaw*, *bow*, &c.

Of Letters Great and Small, and when to be uſed.

FIRST Negatively, *Great Letters* are not to be uſed in the Middle or latter End of a Word, except the whole Word be ſo written, as JEHOVAH, LORD, or Titles of Books, *&c.* For it would be very abſurd to write thus: To Mr. geo RgE RoGeRs In thaMes StReEt.

1ſt, *Great Letters*, or *Capitals*, are written at the Beginning of Sentences; as, Fear God. Honour the King. Know when to ſpeak, and when to hold your Tongue.

2dly, After every Period, or Full Stop, when new Matter begins: As, Some time after that Accident, another fol-

MAY

lowed, which was this, *&c.* London May 16. Turin June 12, *&c.*

3dly, All Proper Names of Perſons, Places, Ships, Rivers, *&c.* are to begin with a Capital ; as, *George*, *London*, the *Dreadnought*, *Thames*, *Severn:* All Chriſtian Names and Surnames, both of Men and Women, muſt begin with a Great Letter ; as *Samuel Sharp*, *Mary Sweeting*, &c.

4thly, The more eminent Words in a Sentence ; as Faith is the Foundation of the Chriſtian Religion ; or any Word that we have a particular Regard or Deference ; as, *God*, *Chriſt*, *King*, *Queen*, &c.

5thly, At the Beginning of every Line in Poetry [illegible],

Improve your Time : Time paſſeth quickly on ;
Nor doth ſo good ſucceed, as that that's gone.

6thly, All Names of Arts, and Sciences, and Trades ; as, *Writing*, *Arithmetic*, *Geometry*, *Muſick*, *Carpenter*, *Smith*, &c. and evermore the Perſonal Pronoun *I*, and the Interjection *O*, muſt be Capitals.

For it is ridiculous to write thus : *On Monday laſt i came to your Houſe, but you was not at home ; then i went, &c.*

Laſtly, I think I may venture to give a general Rule when Capitals are to begin Words ; which is this : All Nouns Subſtantive may begin with a great Letter ; and a Subſtantive may be known by the Signs either of *A*, *An*, or *The* before them ; as, *a Houſe*, *a Mill*, *an Ox*, *an Aſs*, *the City*, *the River*, &c. And I think the Adjective (which declares what Sort of a Thing the Subſtantive is) may be with a Small, and the Subſtantive with a Great Letter ; as, *the white Horſe*, *the long Rope*, *brown Bread*, *fat Beef*, &c.

Small Letters are commonly written in all other Places, as Verbs of the Active and Paſſive Voice, *&c.*

Obſervations concerning the Sound of Letters, and which are omitted in Pronunciation.

A, Is not ſounded in *Pharaoh*, nor in *Sabaoth*, but as if written *Pharo*, and *Saboth* ; neither in *Marriage*, but as *Marrige* ; alſo *Parliament* as *Parliment*, and *Chaplain* as *Chaplin*, &c. In ſome proper Names it is not ſounded, but dropp'd in the Pronunciation ; as in *Aaron*, *Iſaac*, *Canaan*, *Balaam* ; which are pronounced as if written, *Aron*, *Iſac*, *Canan*, *Balam* ; but we muſt except *Baal* and *Ga-al*. *A* is ſounded broad like *aw*, in Words before *ld* and *ll* ; as in *bald*, *ſcald*, *ball*, *wall*, *fall*, &c.

B is not ſounded in *thumb, dumb, plumb, lamb, doubt, debt, ſubtle,* &c. but ſounded as if written *thum, dum, plum, lam, dout, det, ſuttle.*

C is ſounded hard like *K,* before *a, o,* and *u,* and before *l* and *r*; as in theſe Words, *cane, came, comb, cub, clay, crane, crab*; and ſoft in *cement, city,* and *tendency: C* loſeth its Sound in *ſcene, ſcience,* and *victuals,* and in *verdict,* likewiſe in *indict, indictment*; alſo before *k,* as in *ſtack, rack, ſtick, thick, brick.*

Ch is ſounded like *K,* in Words of Foreign Extraction and in many proper Names of the holy Scripture; as in *Chorus, Chymiſt, Chryſoſtom, Chriſt, Chederlaomer, Baruch, Archippus,* &c *Ch* in *French* Words ſound like *ſh,* as in *Chevalier,* pronounced as *Shevalier: Machine* as *Maſheen, Mareſchal* as *Marſhal, Capuchin* as *Capuſheen, Chaiſe* as, *Shaize,* &c.

D is not ſounded in *Ribband,* nor in *Wedneſday,* but pronounced as *Ribbin* and *Wenſday*; the Termination *ed* is ſhortened into *t*; as *burned, burnt*; *choaked, choakt*; *ripped, ript*; *paſſed, paſt*; *chopped, chopt,* &c.

E is not ſounded in *heart,* neither in *hearth,* or *dearth,* &c. and ſeldom heard but in Monoſyllables; as in *me, he, ſhe, ye, the,* &c. where it hath the Sound of *ee*: But in Words derived from the *Hebrew* and *Greek, e* hath its perfect Sound, as *Jeſſe, Jubile, Mamre, Nineve, Candace, Cloe, Eunice, Penelope, Salmone, Phebe, Epitome, Cataſtrophe, Gethſemane*; and from the *Latin ſimile,* and *premunire,* &c. *E final,* or *e* at the End of a Word, ſerves to lengthen the Sound, and to diſtinguiſh it from other Words without *e,* which are ſounded ſhort; as in theſe Examples following, *viz. cane, can*; *hate, hat*; *bite, bit, fare, far*; *hope, hop*; *made mad*; *mane, man*; *ſcrape, ſcrap*; *ſtare, ſtar*; *tune, tun*; *write, writ,* &c. And in Words of more than one Syllables, lengthens the Sound of the laſt Syllable, but doth not increaſe the Number of Syllables; as *admire, demiſe, blaſpheme,* &c. *E* lengthens the Syllable in *Tyre, Kenite,* and *Shu-la-mite. E* muſt not be made to lengthen a Syllable, when it is made ſhort by two Conſonants; as in *paſs, turn, black*, not *paſſe, turne, blacke.* Words ending in *cre, gre,* and *tre,* ſound the *e* before the *r,* as in theſe Words; *acre, lucre, centre, ſepulchre, tygre, maugre, mitre, luſtre*; which are ſounded as if written *aker, luker, ſenter, ſepulcher, tyger, mauger, miter,* and *luſter. E final,* when not ſounded, ſerves to ſoften *c* and *g*, as in *ace, place, lace, ſpice, truce, oblige, huge, age,* &c. If Nouns in *e final* take *s* after them with an Apoſtrophe before it, it ſtands for *his*, as the *Pope's Eye*, or the *Eye of the Pope*. If without an Apoſtrophe, it makes the plural Number, as *Tables*. *E* muſt be joined to long *ſ* in theſe Words; *Horſe, Nurſe, Purſe*; not *Hors, Nurs,* or *Purs*. If to *e* at the End of a Word, a long Vowel be added, the *e* is to be omitted, as in *writing, loving, doing,* &c. not *writeing, loveing,* or *doeing*; except the Terminations *ge* and *ce* before *able*, as in *change-able, peace-able,* &c. *E* muſt not be written after a Diphthong, in theſe Words; *vain, maid, gain, fear, gnaw,* &c. not *vaine, maide, gaine,* &c.

F in Plurals is changed into *v*; as *ſtrife, ſtrives*; *ſtaff, ſtaves*.

G is not ſounded in *ſign, reign,* neither in *gnaw, gnat, aſſign, deſign, ſeignior, ſeraglio, phlegm,* &c. but ſounded as if *ſenior, ſeralio, fleme*. *G* is ſounded ſoft in *gender, ginger,* and *gipſy*; but hard in *Gibeon, Giberah, Gilboa, Geth-ſemane*; and hard alſo in theſe proper Names, *Gibſon, Gilman,* and *Gilbert*; and likewiſe in theſe common Words, *gelt, geld, gird, gimp, geeſe, gander, gabble, gather, girl,* &c. Obſerve, That if *G* be hard with a long Vowel, *ue* is joined, and pronounced in the ſame Syllable; as in *Plague, Prague, Hague, rogue, league, dialogue, catalogue,* &c.

Gh in the End of ſome Words, where *au* or *ou* goes before, hath the ſound of *ff*, as in *tough, rough, cough, laugh*, ſounded as if *tuff, ruff, coff, laff*; but *huff, cuff, ſnuff,* and *buff*, muſt be ſo written.——*Gh* is not ſounded in *mighty, though, through,* neither in *daughter* or *Vaughan*.

H hath Place, but no Sound, in *Chryſtal, Chronicle, Chriſt, Ghoſt, John, Rhine, Schedule* and *Schiſm*. *H* is not ſounded at the End of Words, if it be alone, without *t* or *c* before it, as *ſnatch, watch,* &c.

I is not ſounded in *adieu, juice, veniſon, fruit, bruiſe, Saliſbury*; but ſounded like *ee* in *oblige, Magazine* and *Machine*, &c. *I* is ſounded long in proper Names ending in *iah*, as *Jeremiah, Hezekiah*; but ſhort in *A-ri-el and Mi-ri-am*.——The tail'd *j*, or Conſonant, hath been ſpoke of before.

K is nearly allied in Sound with *C*; but to know when to uſe one, and when the other, *Note*, that *C* hath the Force of *K* only before *a, o, oo,* and *u*, and theſe two Conſonants *l* and *r*; and therefore we muſt not write, *kare* for *care*, *kow* for *cow*, *krown* for *crown* : And the Uſe of *K* is only before *e*, *i*, and *n* ; wherefore we muſt write *keep*, *key*, *knight*, *kill*, &c. not *ceep*, *cey*, *cnight*, nor *cill*: We muſt write *Calendar*, *Catherine*, rather than *Kalendar*, or *Katherine*.

L is not ſounded in *calf*, *half*, *chalk*, *ſtalk*, *walk* ; but pronounced as if *cafe*, *hafe*, *chauk*, *ſtauk*, *wauk*. Neither is *l* pronounced in *Briſtol*, *Holborn*, *Lincoln*, *ſalmon*, or *chaldron* ; but ſounded as if writ *Briſtow*, *Hoburn*, *Lincon*, *ſammon*, and *chaudern* ; nor in *Colonel*, where the firſt *l* hath the Sound of *rr*, as *Corronel*.

M hath the Sound of *n*, in the Word *accompt*.

N is not heard in *autumn*, *lime-kiln*, *ſolemn*, *limn*, *hymn*, *column*, nor in *condemn*.

O is not ſounded in *people*, *feoffee*, *baſon*, *mutton*, and loſt alſo in *yeoman*, *maſon*, *righteous*, *bacon*, *jeopardy*, and *crimſon*.—*O* ſometimes ſounds like *oo* ; as in *doing moving*, *proving*, &c. *O* is not heard in *coroner*, *damoſel*, *Nicholas*, *carrion*, nor in *chariot* ; but pronounced as if writ *crowner*, *damſel*, *Nicklas*, *carrin*, and *charrit*.———*O* is ſometimes ſounded like *i* ; as in *women*, and *flagon*, pronounced as if *wimmen*, and *flaggin*. And ſometimes *O* is ſounded as *u*, as in *conduit*, *conjure*, *atturney*, and *Monmouth*, being heard as if writ *cundit*, *cunjure*, *atturney*, and *Munmouth*.

P is written, but not ſounded, in *empty*, *preſumptuous*, *pſalm*, *ſumpter*, *accompt*, *attempt*, *pſalter*, and *ſymptom* ; alſo in *ſumptuous*, *contemptuous*, *receipt*, and *conſumptive* ; &c.

Ph have the Sound of *f*, when together in one Syllable ; as in *philoſophy*, *phyſician*, *Aſaph*, and *elephant* ; but we muſt not write *filoſophy*, *fyſician*, nor *Aſaf*, or *elefant* : *Ph* are parted in *ſhep-herd*, *up-hold*, and in *Clap-ham* ; and other ſuch compounded words.

After *Q* always follows *u* in all Words ; and in *French* Words it hath the Sound of *k* ; as in *riſque*, *liquor*, *catholique*, *banquet*, *conquer*, *maſquerade*, *chequer* ; pronounced as *riſk*, *likker*, *catholic*, *banket*, &c.

S is not ſounded in *iſland*, *viſcount*, or *iſle*, nor in *Liſle* ; but pronounced as *iland*, *viccunt*, *ile*, and *Lile*.

There be two ſorts of ſ's, the long *ſ*, thus *ſ* ; and the little *s*, thus *s* ; the long *ſ* in the Beginning and Middle of Words, (but never at the latter End) and the ſhort or ſmall *s* at the latter End of Words, and ſounds *hard* like *z*, in all the Words of the plural Number, and in Words of the third Perſon ; as *names*, *worms*, *he reads*, *ſhe hears*. *S* ſounds *hard* in Words that terminate in *ſion*, as in *circumciſion*, *evaſion*, *deluſion* ; but after a Conſonant *ſoft*, as in *converſion*. *commiſſion*, *dimenſion*. *S* is likewiſe ſounded hard in theſe Words, *raiſe*, *praiſe*, *chaiſe*, *cheeſe*, *theſe*, *compoſe*, *expoſe*, *bruiſe*, *refuſe*, *applauſe*, *pauſe*, *clauſe*, *wiſdom*, *caſement*, and *damſel*.——I do not think it any very great Abuſe, to have the ſmall *s* ſometimes in the Beginning or Middle of a Word, as well as at the latter End ; eſpecially if a *t* follows it, thus *st*.

Th ſounds *fine* in *thin*, *think*, and *wrath* ; and is ſounded *hard* in *thee*, *then*, *they*, *that*, *blithe*, *tithe*, and *ſithe* ; alſo in *mother*, *brother*, *hither*, *thither* ; and in *loath*, *cloath*, and *clothier*, &c.

Ti before a Vowel or Diphthong, hath the ſound of *ſi* ; as in *patience*, *dictionary*, *gratian*, *oblation*, *nation*, *tranſlation* ; except when *ſ* goes juſt before it, as in theſe Words, *queſtion*, *fuſtian*, *baſtion*, *combuſtion*, and *celeſtial*, and alſo *beſtial*, &c. In ſome Words of *Hebrew* and *Greek*, *ti* retains its natural Sound ; as in *Shealatiel*, *Phaltiel*, *Shephatiah*, *Cotittia*, *Adramyttium*, and the like ; and in *mightier* and *mightieſt*, *emptieſt*, *emptied* ; and from *pity*, we ſay *pi-ti-able*.

U is ſounded like *i* in *bury*, *birry* ; *buſy*, *bizzy* ; *buſineſs*, as *bizneſs*,

W is not ſounded, though written, in *anſwer*, *ſword*, *whore*, nor in *ſwooning away* ; neither is it heard in *wrap*, *wrath*, *wrong*, *wretch*, *wreath*, *wrangle*, *wriggle* ; but pronouuced as if *ſord*, *hore*, *ſouning*, and hath the Sound of *R* in the laſt ſeven Words. *viz. rap*, *rath*, *rong*, &c.

Wh belongs to Words purely *Engliſh* ; as *what*, *when*, *where and wheel*.

X is ſounded as *z*, in *Xenophon*, *Xerxes*, *Xenocrates*, and *Xantippe*.

Y is either a Vowel or Conſonant, as hinted before. A *Vowel*, in *my*, *by*, *ſly*, *thy* ; and ſometimes, when *a Vowel*, it hath the Sound of *ee*, as in *worthily*, *chriſtianity*, *liberty*, *formerly*, *formally*, *Normandy*, and *Dorothy*. *Y* is a *Conſonant* when it begins a Word, as in *yet*, *you*, *yonder*, *younger*, and *yeſterday*.

Z hath its proper Sound in *Zeno*, *zeal*, *zealous*, and in *Zenobia*. It hath the Sound of *ſ* in *Elizabeth*, *ſize*, *prize*, and *Melchizedeck* ; the firſt of which Words hath been formerly, and ſometimes now is, writ with an *ſ* thus, *Eliſabeth*.

Thus far for the Sound of Letters ſingle ; and now I ſhall give a few Notes concerning two Letters, when they are united in one Sound, called *Diphthongs:* and firſt of

Ai and *Ay*. Theſe have the Sound of *a*, in *air*, *fair*, *pair*, *may*, *ſtay*, *play* ; but *a* is loſt in *Calais*, (a Town in *France*) and pronounced ſeparately in *Sinaï*, (a Mountain of *Arabia*.)

Ei and *Ey*, are ſounded in *eight*, *ſtreight*, *ſleight*, and *hey-day !* and are pronounced as *e*, in *key*, *veil*, and *convey* ; but *eye* muſt be excepted : And *ei* is ſounded as *a* in *neighbour* and *heir*, being pronounced as *nabor* and *are*.

Oi and *Oy* have a Sound peculiar to themſelves ; as in *oil* and *oyſter* ; but make no Diphthong in *going* or *doing*.

Au and *Aw*, commonly keep a proper Sound ; as in *augur*, *auſtere*, *daw*, *maw*, *ſaw*, &c. but *au* is loſt in *aunt* and *gauger*, being ſounded as *ant* and *gager* ; likewiſe is not heard in *Em-ma-us*, and *Ca-per-na-um*.

Eu and *Ew* have an united Sound in all Words, as in *feud*, *brew*, *new*, and *grew* ; but *eu*, is no Diphthong in *Zac-che-us*, or in *Bar-ti-me-us*.

Ou and *Ow*. *Ou* is expreſſed in *foul*, *ſoul*, *proud*, *loud* ; and *ow* in *how*, *cow*, and *now* ; but *ou* ſounds like *oo*, in *ſoup*, (a *French* Diſh) *Stroud*, (a Town in *Kent*) and *Cowper*, (a Man's Name) ſounded as if *ſoop*, *Strood*, and *Cooper*.

Ee is no Diphthong, *in Be-e-rites*, *Be-erſhe-ba*, and in *Be-elze-bub*, one of the *e's* is dropt in Pronunciation ; neither in Words beginning with *re*, or *pre* ; as *re-enter*, *pre-e-mi-nence*.

Oo is properly ſounded in *cool*, *fool*, *pool*, and *tool*, but hath the Sound of *u*, in *root*, *foot*, and *ſoot* ; and makes no Diphthong in *Co-os*, *co-o-pe-rate*.

Ea ſound like *a*, in *ſea*, *pea*, *ſeam*, and *ream* ; and hath the Sound of *e* in *bread*, *head*, *lead*, *dead*, *ſearch*, *leather*, *feather*, *heaven*, and *leaven* ; but is no Diphthong in *ven-ge-ance*, *miſ-cre-ant*, or any *Hebrew*, *Greek*, or *Latin* Words ; as in *Ka-deſh*, *Bar-ne-a*, *Kir-jath-je-a-rim*, nor in *Ce-ſe-re a*, *i-de-a*, or *o-ce-an* ; neither in *re-al*, *be-a-ti-tude*, *cre-a-tor* ; but except *creature* ; nor in Words beginning with *pre*, as *pre-amble*, &c.

Oa is ſounded as *o*, in *goat*, *boat*, and *coat* ; and ſounded broad, as *au*, in *broad* and *groat* ; but is no Diphthong in *Go-a*, (a City in *India*) or in the *Hebrew* Words *Zo-an*, *Zo-ar*, and *Gil-bo-a*.

FACE PAGE 8

1

An easy Copy for Round Hand.

A B C D E F G H I K L M N

O P Q R S T U V W X Y Z

a b c d e f g h i k l m n o p q r ſ

s t u v w x y z &c. 1.2.3.4.5.6.7.8.9.10.

Take great Care, and you'll Write fair.

The Italian Hand.

A B C D E F G H I K L M
N O P Q R S T V W X Y Z

---

a b c d e f g h i k l m n o p q
r ſ s t u v w x y z &c.

Art is gain'd by great Labour & Industry.

Ie before a ſingle Conſonant, ſounds like *ee*, as in *brief*, *chief*, and *thief*; but if before two Conſonants, it ſounds like *e*; as in *friend*, *field*; but at the End of *Engliſh* Words, *e* final is not heard, as in *die*, *ſignifie*; and is no Diphthong in *A-bi-e-zer*, *E-li-e-zer*, nor in the *Engliſh* Words *di-er*, *car-ri-er*, or *clo-thi-er*; and in Words derived from the *Latin*, *ie* is parted, as in *cli-ent*, *o-ri-ent*, *qui-et*, and *ſci-ence*.

Ui is ſounded as *u* in *juice*, *fruit*, and *ſuit*; but *u* is loſt in *conduit*, *build*, and *guiſe*, and is no Diphthong in *je-ſu-it*, *ge-nu-in*, or *fru-i-ti-on*.

Æ and *OE* be no *Engliſh* Diphthongs, but are uſed in *Æſop*, *Æneas*, *Ætna*, *Cæſar*, *Oedipus*, and *Oeconomy*; but in common Words they are neglected; as in *equity*, *female*, and *tragedy*, tho' derived of *æquitas*, *fœmina*, and *tragædia*.

Of Syllables, *and their Diviſion, being the Art of Spelling.*

A *Syllable* is a taking Letters together, and uttering them in one Breath, as *vir-tue*, ſo that *virtue* being thus divided, or taken aſunder, makes two *Syllables*, viz. *vir* and *tue*; which put together, forms the Word *virtue*. And many times a Vowel, or a Diphthong, of themſelves, make a *Syllable*; as in *a-bate*, *e-ve-ry*, *i-dle*, *o-ver*, *u-ſu-rie*, ſo of *Diphthongs*, as *au-ger*, *Eu-ſtace*, *ow-ner*, *ai-der*, *oy-ſter*, *Ea-ton*, *oa-ten*: By which we may particularly note, That no *Syllable* can be made, be there never ſo many *Conſonants*, or ſo few, without the Aid of a *Vowel* or *Diphthong*.

The longeſt *Monoſyllables* we have in *Engliſh*, are *length*, *ſtrength*, and *ſtreights*; which ſtill would be nothing, without the Vowel *e* and *i*.

All Spelling may be taken in, under theſe four following general Rules, or Heads.

1*ſt*, When a *Conſonant* comes between two *Vowels*, in dividing the Word into *Syllables*, the *Conſonant* is joined to the latter Vowel; as in *ſta-ture*, *na-ture*, *de-li-ver*, *u-ni-ty*, *&c.* except compound Words, which terminate in *ed*, *en*, *eſt*, *eth*, *er*, *ing*, *iſh*, and *ous*; as *coaſt-ed*, *gold-en*, *know-eſt*, *know-eth*, *bear-er*, *fool-ing*, *bar-ba-rous*, *ra-ven-ous*, and *ſub-urbs*.

2dly, When two *Conſonants* come together in the Middle of a Word, they are to be parted; if not proper to begin a Word; as *num-ber*, *ſtran-ger*, *for-tune*, &c. not *numb-er*, *ſtrang-er*, *fort-une*: To this Rule is excepted Words with *x*, as *ox-en*, *ex-er-ciſe*, &c. When the ſame Conſonant is doubled in a Word, the firſt belongs to the foregoing, and the latter to the following Syllable, as in the Rule above, and in theſe Words, *Ab-ba*, *ac-cord*, *an-no*, *ad-der*, &c.

3*dly*, *Conſonants* that can begin Words, muſt not be parted in the Middle; as *a-gree*, *be-ſtow*, *re-frain*, &c. not *ag-ree*, *beſ-tow*, *ref-rain*.——Theſe *Conſonants* may begin Words, *viz.* *bl*, *br*, *ch*, *cr*, *dr*, *dw*, *fl*, *fr*, *gh*, *gl*, *gr*, *kn*, &c. as *blunt*, *break*, *chaw*, *cry*, *draw*, *dwell*, *fleſh*, *ghoſt*, &c. On the contrary *Conſonants* that cannot begin Words, muſt be parted in the Middle, as in *Sul-tan*, and as ſaid above.

4*thly*, When two *Vowels* come together, not making a Diphthong, they muſt be divided, as in *vi-al*, *va-li-ant*, *Li-o-nel*, *du-el*, *cru-el*, *me-te-or*, and *La-o-di-ce-a*.

Some particular Notes.

L is doubled in Words of one Syllable: as *well*, *tell*, *ſwell*, *ball*, *wall*, *fall*, *will*, *hill*, *mill*, &c. But in Words of more than one Syllable, the Word always terminates with ſingle *l*, as *angel*, *Babel*, *hurtful*, *dutiful*, and *beautiful.* Neither muſt *l* be doubled in *alway*, *alſo*, *although*; not *allway*, *allſo*, *allthough*, &c. But Words accented on the laſt Syllable, muſt be excepted from the Rule above *viz.* *inſtáll*, *recáll*, *inróll*, *rebéll*, and *repéll*.

Y muſt be uſed before the Termination *ing*, as *buying*, *lying*, *carrying*, *marrying*, *paying*, *ſlaying*, *burying*, &c.

The long *ſ* muſt never be uſed at the End of a Word, or immediately after the ſhort or ſmall *s*.

X ſhould be uſed inſtead of *ct*, where it appears to have been in the Original; as *reflexion*, *connexion*, rather than *reflection*, or *connection*, &c.

Remember, that if you cannot write out the whole Word at the End of the Line, break it off at the End of a Syllable,
thus ———————————————— con-
demn; not thus ———————————————— cond-
emn: Again ———————————————— diſ-
charge; not ———————————————— diſc-
harge.

C muſt not be put between two *Conſonants*; as *think*, not *thinck*; *thank*, not *thanck*; *brink*, not *brinck*; but if a Vowel goes before *c*, you muſt write *c* before *k*, as *brick ſtick*, *thick*, &c.

E final muſt not be placed after a Syllable made long by a Diphthong, as *rain*, not *raine*; *brain*, not *braine*; *re-*

ſtrain, not *reſtraine*, &c. Neither is it neceſſary after a double Conſonant, as *inn*, and *add*; not *inne*, or *adde:* But we muſt except *Anne*, a Chriſtian Name, and *Donne*, a Surname; and alſo *Deale*, the Name of a Town in *Kent*.

Ph muſt be retained in Words of a Foreign Original; as *phancy*, *prophet*, not *fancy*, *profet*.

U follows *Q* in all Words, as was ſaid before.

Q is better than *C*, in ſome Words from the *Latin*, as *oblique*, *antique*, *relique*, rather than *oblike*, *antike*, or *relike*. Alſo *paquet*, *riſque*, *traffique*, and *fabrique*, from the *French*.

K is by ſome thought unneceſſary in Words of Foreign Extraction, *viz. arithmetic*, *muſic*, *logic*, *public*, *catholic*, and *phyſic*; rather than *arithmetick*, &c.

Of *S* and *C*. Some People may eaſily drop into Error by miſtaking *S* for *C*, as in the Beginning of the following Words, where *C* hath the perfect Sound of *S*, though *C* muſt undoubtedly be written, *viz.* in

Ceiling
Celeſtial
Civet
Certain
Cymbal
Ciſtern
Centurion
Cinnamon
Ceremony
Cellar
Cenſure
Cenſor
Ceaſe
Celebrate
Cell
Cenſer
Celerity
Cypreſs
Circle
Circuit
Cement
Ceruſe
Centre
Cinque
Cypher
City
Citron

But theſe Words muſt be written with *S*, *viz.*

Science
Schedule
Sceptre
Scheme
Scarcity
Schiſm
Sciatica
Scythian.

When to write *ti*, and when *ſi* ——— *viz.*

with ti.	*with* ſi.
Contention	Confuſion
Action	Occaſion
Contradiction	Contuſion
Attention	Oppreſſion
Benediction	Alluſion
Apparition	Aſcenſion
Concoction	Averſion
Declaration	Aſperſion
Ambition	Commiſſion
Contrition	Comprehenſion
Oration	Circumciſion
Oblation	Concluſion

Theſe Words ſpell thus,

Paſſion, *not* Paſhon.
Faſhion, *not* Fation.
Cuſhion, *not* Cution.
Glouceſter, *not* Gloſter.
Worceſter, *not* Worſter.
Saliſbury, *not* Salſbury.
Leiceſter, *not* Leſter.
Shrewſbury, *not* Shroſbury.
Carliſle, *not* Carlile.
Weſtminſter, *not* Weſtmiſter.

Another Qualification in Spelling, is rightly to diſtinguiſh Words of the *ſame Sound*, though widely different in their Senſe and Signification: Such as theſe that follow, *viz.*

A.

ABel, *Cain*'s Brother
Able, to do a Thing
A Bell, to ring
Accidents, Chances
Accidence, a Book
Acre, of Land
Acorn, of an Oak
Achor, a Valley of that Name
Advice, Counſel
Adviſe, to counſel
Account, Eſteem
Accompt, of Reckoning
Ale, a drink
Ail, Trouble
All, every one
Awl, for Shoemakers
Alley, a narrow Place
Ally, a Friend or Confederate
Allay, or give Eaſe
Alloy, baſer Metal
Altar, for Sacrifice
Alter, to change
Ale-hoof, an Herb
Aloof, at a Diſtance
Allow'd, approv'd
Aloud, to ſpeak ſo
Amiſs, wrong
A Miſs, or Miſtreſs
Ant, a Piſmire
Aunt, a Father's Siſter
Anchor, of a Ship
Anker, a Runlet
A Peal, of Bells
Appeal, to higher Powers
Appear, to be ſeen
A Peer, a Lord
Aray, good Order
Array, to clothe
A Roſe, to ſmell to
Aroſe, did riſe
Are, they be
Heir, to an Eſtate
Arrant, notorious
Errand, a Meſſage
Arrows, to ſhoot
Arras, Hangings
A Scent, or Smell
Aſcent, a going up
Aſſent, Agreement
Aſſiſtance, Help
Aſſiſtants, Helpers
Augur, a Soothſayer
Augre, to bore with
Ax, to cut with
Acts of Parliament
Auſtere, ſevere
Oyſter, a Shell-fiſh

B.

Babel, the Tower
Babble, to prate
Bacon, Hog's Fleſh
Baken, in the Oven
Beckon, to make a Sign
Bail, a Surety
Bale of Goods

Bald, without Hair
Bawl'd, cry'd out
Ball, to play with
Bawl, to cry aloud
Barbara, a Woman's Name
Barbary, in Africa
Barberry, a Fruit
Bare, naked
Bear, a Beaſt, or to bear
Bays, of Bay-Trees
Baize Cloth, of Colcheſter
Baſe, vile
Baſs, in Muſic
Belly, Part of the Body
Belie, to ſpeak falſely
Be, they are
Bee, that makes Honey
Beer, to drink
Bier, to carry the Dead on
Bell, to ring
Bel, an Idol
Berry, a ſmall Fruit
Bury, the Dead
Blue, a Colour
Blew, as the Wind
Board, a Plank
Bor'd a Hole
Boar, a Beaſt
Bore, to bore
Boor, a Country Fellow
Bold, confident
Bowl'd, at the Jack
Bolt the Door
Boult the Meal
Bow, to bend, or the Bow
Bough, of a Tree
Boy, a Lad
Buoy, of an Anchor
Bread, to eat
Bred, brought up
Breeches, to wear
Breaches, broken Places
Bruit, a Report
Brute, Beaſt
Burrow, for Coneys
Borough, a Corporation
By, near
Buy, with Money
Brews, he breweth
Bruiſe, a Hurt
Brewis, of Fat and Bread

C.

Cain, that killed his Brother
Cane, to walk with
Caen, in Normandy
Calais, in France
Chalice, a Cup
Call, by Name
Cawl, or Suet
Cannon, a great Gun
Canon, a Church Rule
Capital, great or chief
Capitol, a Tower in *Rome*
Career, full Speed
Carrier, of Goods
Cellar, for Liquors.
Seller, that ſelleth
Cenſer, for Incenſe
Cenſor, a Reformer
Cenſure, to judge
Centaury, an Herb
Century, an hundred Years
Centry, a Sentinel, a Soldier on Guard
Chair, to ſit in
Chare, a Job of Work
Champaine, Wine of *France*
Campaign, a wide Field, or Summer's Expedition.
Choler, Rage or Anger
Collar, of the Neck
Coller, of Beef or Brawn
Ceiling, of a Room
Sealing, with a Seal
Cittern, for Muſic
Citron, a Fruit

Clerk, a Clergyman
Clerk, of a Pariſh
Clauſe, Part of a Sentence
Claws of a Beaſt or Bird
Coat, a Garment
Cote for Sheep
Comb for the Hair
Come hither
Commit, to do
Comet, a blazing Star
Common, uſual
Commune or converſe
Condemn to Death
Contemn, to deſpiſe
Council of the King
Counſel, Advice
Cou'd or could
Cud, to chew as Beaſts
Current, a paſſing or running Stream
Courant, a Meſſenger or News-paper
Currants, Fruit
Crick in the Neck
Creek of the Sea or River
Couſin, a Relation
Cozen, to cheat
Cymbal, a muſical Inſtrument
Symbol, a Mark or Sign
Cypreſs, a Tree
Cyprus, an Iſland
Cruſe for Oil
Cruize, by the Sea Coaſt
Cygnet, a young Swan
Signet, a Seal

D.

Dane, of *Denmark*
Daign, to vouchſafe
Dam, ſtopping Water
Damn, to condemn
Dame, a Miſtreſs
Dear of Price
Deer, in a Park
Deceaſed, dead
Diſeaſed, ſick
Decent, becoming
Deſcent, going down
Diſſent, to diſagree
Deep, low in the Earth
Diep, a Town in *France*
Defer, to put off
Differ, to diſagree
Derbe, a City of *Aſia*
Derby, a Town of *England*
Deſert, Merit
Deſart, a Wilderneſs
Dew, a falling Miſt
Due, owing
Do, to make
Doe, a Female Deer
Dough, Paſte
Don, a *Spaniſh* Lord
Done, acted
Dun, of Colour
Dolphin, a Fiſh
Dauphine, the *French* King's eldeſt Son
Devices, Inventions
Devizes, in *Wiltſhire*
Doer, that doeth
Door of a Houſe
Dragon, a Beaſt
Dragoon, a Soldier
Draught of Drink
Drought, Dryneſs
Dolour, Grief or Pain
Dollar, a Piece of Money
Demure, ſober
Demur, a Stop or Doubt

E.

Ear of the Head
E'er, ever
Early, betimes
Yearly, every Year
Earth, the Ground
Hearth of the Chimney

Eaſter, the Feſtival
Eſther, a Woman's Name
Enter, to go in
Interr, to bury
Elder, not the Younger
Eldern, a Tree
Eaten or ſwallowed
Eaton, a Town's Name
Eminent, famous
Imminent, over Head
Enow in Number
Enough in Quantity
Earn, to deſerve
Yarn, Woollen Thread
Yearn, to pity
Envy or Hatred
Envoy, a Meſſenger
Exerciſe, Labour or Practice
Exorciſe, to conjure
Err, to miſtake
Er, Brother to *Onan*, Sons of *Judah*
Extant, in being
Extent, Diſtance

F.

Fain, deſirous
Feign, to diſſemble
Fair, beautiful, or a Market
Fare, Victuals
Faint, weary
Feint, a falſe March
Fourth in Number
Forth, to go out
Feed, to eat
Fee'd, rewarded
Fir, Wood
Fur or Hair
Felon, a Criminal
Fellon, a Whitlow
File of Steel
Foil, put to the worſt
Fly as a Bird
Fly, or Inſect
Fillip with the Fingers
Philip, a Man's Name
Flower of the Field
Flour, Meal
Floor of a Room
Follow, to come after
Fallow, Ground not plow'd
Find, to find any thing
Fin'd, amerced
Fiend, a Devil
Flea off the Skin, and alſo a Vermin
Flee, to eſcape
Fowl, a Bird
Foul, dirty
Francis, a Man's Name
Frances, a Woman's Name
Frays, Quarrels
Froiſe, Pancake with Bacon

G.

Gall of a Beaſt
Gaul, France
Garden of Herbs
Guardian, an Overſeer
Genteel, graceful
Gentile, a Heathen
Gentle, mild
Geſture, Carriage
Jeſter, a merry Fellow
Groan with Grief
Grown greater
Guilt of Sin
Gilt with Gold
Greater, bigger
Grater for Nutmegs
Grave for the Dead
Greave, Armour for the Leg
Gueſs, to imagine
Gueſt, one entertained
Gluttonous, greedy
Glutinous, ſticking as Pitch
Great, large
Grate for Coals, *&c*

Graze, to eat
Grays, a Town
Groat, four Pence
Grot, a Cave
Gallies, Ships with Oars
Gallows, for Criminals

H.

Hare of the Fields
Hair of the Head
Harſh, ſevere
Haſh, minced Meat
Haven, a Harbour
Heaven, a large Place of Happineſs
Heart of the Body
Hart of the Woods, or an over-grown Buck
Herd of Cattle
Heard, did hear
Hard, not ſoft, or difficult
Here, in this Place
Hear with the Ears
High, lofty
Hie, away, make haſte
Him, that Man
Hymn, to ſing
Hail, congealed Rain
Hale the Ship
Hall, in a Houſe
Haul, pull
Higher, taller
Hire, Wages
His, of him
Hiſs, as a Snake, or to deride
Hoar Froſt
Whore, a lewd Woman
Hole, or Hollowneſs
Whole, intire
Ho! lo! to call
Hallow, to make holy
Holy, pious
Wholly, intirely
Home, one's Houſe
Holm, Holly
Hoop for a Tub
Whoop, or ho! lo!
Hugh, a Man's Name
Hue, of Colour
Hew, with an Ax

I.

I, I myſelf
Eye to ſee with
Idle, lazy
Idol, an Image
I'll, I will
Ile, of a Church
Iſle, an Iſland
Oil of Olives
Imploy in Work
Imply, to ſignify
In, within
Inn for Travellers
Incite, to ſtir up
Inſight, Knowledge
Ingenious, of quick Parts
Ingenuous, candid
Iron, Metal
Ironie, ſpeaking by Contraries

K.

Ketch, a Ship
Catch, to take
Kill, to ſlay
Kiln for Lime
Kind, good-natur'd
Coin'd Money
Knave, diſhoneſt
Nave of a Wheel
Knight by Honour
Night, Darkneſs

L.

Laid, placed
Lade the Water
Lane, not a Street
Lain, did lie
Latin, a Tongue
Latten, Tin

Flourishing Alphabet.

A B C D E F G H

I K L M N O P Q

R S T U W X Y Z

Secretary Hand.

A B C D E F G H I K L M N
O P P Q Q R S T V W X Y Z Z

A a b c d e f g h i j k l m
n o p q r ſs t v u w x y z z.

Fear God and Honour the King.

Lattice of a Window
Lettice, a Woman's Name
Lettuce, Sallad
Leaſe of a Houſe
Leaſh, three
Lees of Wine
Leeſe, old Word for loſe
Leaper, that jumpeth
Leper, one leprous
Leſſen, to make leſs
Leſſon, to read
Leaſt, ſmalleſt
Leſt, for fear
Lethargy, Sleepineſs
Liturgy, Church-ſervice
Lier in wait
Lyar, that tells Lies
Limb, a Member
Limn, to paint
Line, Length
Loin of Veal
Low, humble
Lo, behold
Loſe, to ſuffer Loſs
Looſe, to let go
Lower, to let down
Lour, to frown

M.

Made, finiſhed
Maid, a young Woman
Main, Chief
Mane of a Horſe
Male, the He
Mail, Armour
Manner, Cuſtom
Manor a Lordſhip
Market, to buy or ſell in
Mark it, note it
Marſh, low Ground
Maſh for a Horſe, or of a Net
Martin, a Man's Name
Marten, a Bird
Mead, a Meadow
Mede, one of *Media*
Mean, of low Value
Mein, Carriage or Aſpect
Meat to eat
Mete, to meaſure
Meſſage, Buſineſs
Meſſuage, a Houſe
Mews for Hawks
Muſe, to meditate
Mighty, powerful
Moiety, half
Mile, Meaſure
Moil, Labour
Might, Strength
Mite in Cheeſe
Moat, a Ditch
Mote in the Sun
More in Quantity
Moor, a Black
Mower that moweth
Moore, barren Ground
Mortar, made of Lime
Mortar, to pound in
Mole, Vermin
Mould to caſt in

N.

Nay, Denial
Neigh as a Horſe
Neither, none of the two
Nether, lower
Naught, bad
Nought, nothing
Nigh, near
Nye, a Man's Name
Nice, curious
Niece, a Brother's Daughter
Not, denying
Knot, to tye
Note, mark
Note of one's Hand
Noſe of the Face
Noah's Ark

O.

Oar of a Boat
Ore, crude Metal
O'er, over
Off, caſt off
Of, belonging to
Our, belonging to us
Hour of the Day
Oh! alas!
Owe, in Debt
One in Number
Own, to acknowledge
Order, Rule
Ordure, Dung

P.

Pair, a Couple
Pare, cut off
Pear, a Fruit
Pattin, for a Woman
Patent, a Grant
Peer, a Lord
Pier, of Dover
Peter, a Man's Name
Petre, Salt
Pail, for Water
Pale of Countenance
Pale, a Fence
Place, Room
Plaiſe, a Fiſh
Parſon of the Pariſh
Perſon, any Man
Pole for Hops
Poll of the Head
Pool of Water
Pore with the Eyes, or of the Skin
Poor, neceſſitous
Palate of the Mouth
Pallet-Bed
Poſy, a Noſegay
Poeſy, Poetry
Power, mighty
Pour as Water
Prey, a Booty
Pray, beſeech
Profit, Gain
Prophet, a Foreteller
Practice, Exerciſe
Practiſe, to exerciſe
Preſence, being here
Preſents, Gifts
Princes, the King's Sons
Princeſſes, the King's Daughters
Pleaſe, to content
Pleas, Defences
Precedent, an Example
Preſident, Chief
Principal, Chief
Principle, the firſt Rule

Q.

Quire of Paper
Choir of Singers
Queen, the King's Wiſe
Quean, a Harlot

R.

Rack, to torment
Wreck of a Ship
Rain Water
Reign of the King
Rein of a Bridle
Rays of the Sun
Raiſe, lift up
Race, to run
Raſe, to demoliſh
Rice, Grain
Riſe, to get up
Red in Colour
Read the Book
Reed of the Water
Relick, a Remainder
Relict, a Widow
Roe of a Fiſh, or a Female Deer
Row the Boat
Right, not wrong

Rite, a Ceremony
Write with a Pen
Wright, a Wheelwright
Rediſh Colour
Radiſh, a Root
Rear, ſet up
Rere, behind
Ruff, for the Neck
Rough, not ſmooth
Rie, Corn
Rye, in *Suſſex*
Wry, crooked
Ring the Bells
Wring the Hands
Rime, a Fog or Miſt
Rhyme, Verſe
Rind of Cheeſe
Rode, did ride
Road, the Highway
Rote, got by Heart
Wrote, did write
Wrought, did work

S.

Savour, Taſte or Smell
Saviour, that ſaves
Sheep, a Beaſt
Ship, for the Sea
Sight, View
Cite, to ſummons
Sail of a Ship
Sale of Goods
Sink, ſink down
Cinque, five
Slow, not quick
Sloe, Fruit
Sow, Seed
Sew, with a Needle
So, thus
Slight, neglected
Sleight of Hand
Some, a Part
Sum of Money
Soul, or Spirit
Sole, a Fiſh
Sole of a Shoe
Son of a Father
Sun in the Firmament
Sore, painful
Soar aloft
Swore, did ſwear
Stare, to look earneſtly
Stair, a Step
Stile, to get over
Style of Writing
Sound, whole, firm; alſo Noiſe
Swoon, to faint away
Straight, not crooked
Strait, narrow
Succour, Help
Sucker, a young Sprig
Spear, a Weapon
Sphere, a Globe

T.

Then, at that Time
Than, in Compariſon
Tame, gentle, not wild
Thame in *Oxfordſhire*
Tear, to rent
Tear of the Eye
Tare, an Allowance in Weight
Tare, a Vetch
Tail of a Beaſt
Tale, a Story
Tiles for the Houſe
Toyles, Nets
Toil, to labour
There, in that Place
Their, of them
Throne of the King
Thrown, as a Stone
Tide, a flowing Water
Ty'd, made faſt
Time of the Day
Thyme, an Herb
Team of Horſes

Teem, with Child
Twice, twice one
To, the Prepoſition
Too, likewiſe
Toe of the Foot
Tow, to draw
Tow, to ſpin
Told, as a Story
Toll'd, as a Bell
Tour, a Journey
Tower of a Church
V.
Vacation, Leiſure
Vocation, a Calling
Veil, a Covering
Vale, between two Hills
Vain, fooliſh
Vein, of the Body
Vane, a Weathercock
Value, Worth
Valley, a Vale
Vial, a Glaſs
Viol, a Fiddle
U.
Your, of you
Ewer, a Baſon
Uſe, Practice
Uſe, to be wont
Ewes, Sheep

W.
Wade in the Water
Weigh'd in the Scales
Whale of the Sea
Wail, lament
Ware, Merchandize
Were, was
Where, what Place
Weigh, to weigh
Wey, five Quarters
Weal, good
Wheal from Scourging
Wield a Sword
Weald, of *Suſſex*, or *Kent*
Wen in the Neck
When, at what Time
White, of Colour
Wight, an Iſland
Whiſt, Silence
Wiſt, knew
Wood of Trees
Wou'd, for would
Y.
Yea, yes
Ye, ye
Ewe, a Sheep
Yew, a Tree
Yarn, made of Wool
Yearn, to weep

Of Stops, Marks, and Points, uſed in Reading and Writing, with their Places and Significations.

THESE are of abſolute Neceſſity; and great Regard ought to be had to them, to avoid Confuſion and Miſconſtruction, and for the better underſtanding of what we read and write ourſelves; and are likewiſe of Uſe to others that ſhall hear us read, or ſee our Writing: They teach us to obſerve proper Diſtances of Time, with the neceſſary Raiſing and Falling of the Tone or Voice in Reading, and the needful Stops or Marks to be uſed in Writing, that we may underſtand it ourſelves, and that our Meaning may not be miſunderſtood or miſapplied by others.

Stops, or Pauſes, conſidered as Intervals in Reading, are indeed no more than four; though there are other Marks to be taken notice of, but to other Purpoſes: The Names of theſe four principal Stops, are, *viz.* a *Comma*, *Semicolon*, *Colon*, and *Period* or *full Stop*; and theſe do bear to one another a kind of progreſſional Proportion of Time; for the *Comma* ſignifies a Stop of leiſurely telling One, the *Semicolon* Two, the *Colon* Three, and the *Period* Four.—— And are made or mark'd thus:

Comma (,) at the Foot of a Word.
Semicolon (;) a Point over the Comma.
Colon (:) two Points.
Period (.) a ſingle Point at the Foot of a Word.

, *Example of the* Comma.) There is not any thing in the World, perhaps, that is more talk'd of, and leſs underſtood, than the Buſineſs of a happy Life.

; *Example of the* Semicolon.) It is not a Curſe that makes way for a Bleſſing; the bare Wiſh is an Injury; the Moderation of *Antigonus* was remarkable.

: *Example of the* Colon.) A ſound Mind is not to be ſhaken with popular Applauſe: But, Anger is ſtartled at every Accident.

Example of the Period.) It is a ſhame, ſays *Fabius*, for a Commander to excuſe himſelf, by ſaying, I was not aware of it. A Cruelty that was only fit for *Marius* to ſuffer, *Sylla* to command, and *Cataline* to act.

By the Examples foregoing, we may eaſily note, that a *Comma* is a Note of a ſhort Stay between Words in the Sentence; and therefore the Tenor of the Voice muſt ſtill be kept up.——The *Semicolon* is a little longer, and the Tone of the Voice very little abated.—The *Colon* ſignifies perfect Senſe, though not an End of the Sentence; and the Voice a little abated, or let fall.—The *Period* denotes perfect Senſe, and the End of the Sentence.

? When the Queſtion is aſked, there is a crooked Mark made over the Period thus? and is called a Note of Interrogation: *Example*, What could be happier than the State of Mankind, when People lived without either Avarice or Envy? The Time of Pauſe for this Stop, is the ſame with the *Semicolon*.

! If a ſudden Crying out, or Wondering, be expreſſed, then this Mark is made over the Full Stop, thus! and called a Note of Admiration, or Exclamation: *Example*, Oh the aſtoniſhing Wonders that are in the elementary World!

( ) If one Sentence be within another, of which it is no Part, then 'tis placed between two Semicircles or Parentheſis, made thus ( ): *Example*; *Pompey*, on the other ſide (that hardly ever ſpake in publick without a Bluſh) had a wonderful Sweetneſs of Nature. Again; Of Authors be ſure to make choice of the beſt, and (as I ſaid before) to ſtick cloſe to them. Once more; Honour thy Father and Mother (which is the firſt Commandment with Promiſe) that it may be well with thee.——In reading a Parentheſis, the Tone muſt be ſomewhat lower, as a Thing or Matter that comes in by the bye, breaking in as it were on the main Coherence of the Period. The Time is equal to a Comma, and ought to be read pretty quick, leſt it detain the Ear too long from the Senſe of the more important Matter.

' *Apoſtrophe*, is a Comma at the Head of Letters, ſignifying ſome Letter or Letters left out for quicker Pronunciation; as *I'll* for *I will*, *would'ſt* for *wouldeſt*, *ſha'n't* for *ſhall not*, *ne'er* for *never*, *is't* for *is it*, *'tis* for *it is*, *i'th'* for *in the*, *o'er* for *over*: Or to denote a Genitive Caſe; as, my Father's Houſe, my Uncle's Wife, *&c.*

´ *Accent* is placed over a Vowel, to denote that the Streſs or Sound in Pronunciation is on that Syllable.

˘ *Breve*, or crooked Mark over a Vowel, ſignifies it muſt be ſounded ſhort or quick.

‸ *Caret* ſignifies ſomething is wanting, and is placed underneath the Line, juſt where any thing omitted, by Miſtake or Forgetfulneſs, *&c.* ſhould be brought in.

^ *Circumflex* is of the ſame ſhape with the Caret, but is placed over ſome Vowel, to ſhew the Syllable to be long, as *Eu-phrâ-tes*.

¨ *Dialyſis*, or two Points placed over two Vowels in a Word, ſignifies they are to be parted, being no Diphthong.

- *Hyphen*, or *Note of Connection*, is a ſtraight Line; which being ſet at the End of a Line, ſhews that the Syllables of that Word are parted, and the Remainder of it is at the Beginning of the next Line; and ſometimes is uſed in compound Words, as Burnt-ſacrifices, Heart-breaking, Soul-healing, Book-keeper, *&c.* *N. B.* That when you have not room to write the whole Word at the End of a Line, but are obliged to finiſh it at the Beginning of the next, ſuch Words muſt be truly divided, according to the Rules of

Spelling; as, re-ſtrain, not———————————reſtrain. When the Hyphen is placed over a Vowel, it is properly a Daſh, and ſignifies the Omiſſion of *m* or *n*; 'tis much uſed in old *Latin* Authors, and ſometimes in *Engliſh*, eſpecially in Law Buſineſs. *Example*; It is very comēdable to write a good Hand.

☞ *Index*, is a Note like a Hand, pointing to ſomething very remarkable.

* *Aſteriſm*, or *Star*, directs to ſome Remark in the Margin, or at the Foot of the Page, Several of them together, denote ſomething defective or immodeſt, in that Paſſage of the Author.

† *Obeliſk*, is a Mark like a Dagger, and refers to the Margin, as the *Aſteriſm* *: And in Dictionaries, it ſignifies the Word to be obſolete, or old, and out of uſe.

¶ *Paragraph*, denotes a Diviſion, comprehending ſeveral Sentences under one Head

§ *Section*, ſignifies the Beginning of a new Head of Diſcourſe, and is uſed in ſub-dividing a Chapter, or Book, into leſſer Parts or Portions.

[ ] *Brackets* or *Crochets*, generally include a Word or Sentence, explanatory of what went before; or Words of the ſame Senſe, which may be uſed in their ſtead.

" *Quotation*, or double Comma reverſe, is uſed at the Beginning of the Line, and ſhews what is quoted from an Author to be in his own Words.

Thus much for Pointing, Stops, and Marks; which if carefully heeded and obſerved, will add Grace and Credit to your Writing.

Of Abbreviations.

TO be ready in theſe, ſhews a Dexterity in Writing; and is very neceſſary for Diſpatch: For by theſe we expeditiouſly expreſs, or ſet down a Word, ſhortening it, by making ſome Initial Letter or Letters, belonging to the Word, to expreſs it; as in the Table following.

A. For Anſwer, or Afternoon.
A. B. Arts Batchelor
A. Bp. Archbiſhop
Ac^{t}. Account
A. D. Anno Domini, Year of our Lord
A. M. Anno Mundi, Year of the World
Adm^{rs}. Adminiſtrators
A. M. Artium Magiſter, Maſter of Arts
Ana, of each a like Quantity
Ap. April, or Apoſtle

Adm^{l}. Admiral
Ag^{t}. Againſt
Am^{t}. Amount
Anab. Anabaptiſt
Aug. Auguſt
A. R. Anno Regni, in the Year of the Reign
Aſt. P. G. Aſtronomy Profeſſor of Greſham College
Auſt. Auſtin, or Auſtria
B. A. Bachelor of Arts
B. D. Bachelor of Divinity
B. V. Bleſſed Virgin
Bart. Baronet
Bp Biſhop
C. Charles, or Chapter
Cant. Canticles, or Canterbury
Cat. Catechiſm
Cha. Charles, or Charity
Chap. Chapter
Cent. Centum
Ch. Church
Chanc. Chancellor
Chron. Chronicles
Capt. Captain
Clem. Clement.
Col. Coloſſians
Cl. Clericus
Co. Country
Coll. Colonel
Com^{rs}. Commiſſioners
Con. Conſtance or Conſtantine
Conf. Confeſſor
Cou'd, for could
Cor. Corinthians or Corollary
Cr. Creditor
C. R. Carolus Rex, or Charles the King
C. C. C. Corpus Chriſti College
C. S. Cuſtos Sigilli, Keeper of the Seal
C. P. S. Cuſtos Privati Sigilli, Keeper of the Privy Seal
D. Dean or Duke
Dan. Daniel
Dr. Doctor, or Debtor
Dea. Deacon
D^{o}. Ditto
D. Denarii, Pence
Dec. Or *xber*, or 10*ber*, December
Devon. Devonſhire
Deut. Deuteronomy
Dec. Deceaſed
D. C. Dean of Chriſt-Church
Doct. Doctrine
D. D. Doctor of Divinity
E. for Earl
Earld. Earldom
Edm. Edmund
Edw. Edward
E. gr. Exempli gratia, for Example
Engl. England
Eliz. Elizabeth
Eſa. Eſaiah
Eph. Epheſians
Eccl. Eccleſiaſtes
Ex. Exodus, or Example
Ev. Evangeliſt
Exp. Explanation
Expo. Expoſition.
Eſq; Eſquire
Exon. Exeter
Fr. French or France
Feb. February
Fra. Francis
F. R. S. Fellow of the Royal Society
G. God, Great or Goſpel
Ga. Galatians
Gen. Geneſis
Gen^{mo}. Generaliſſimo
Geo. George

G. R. Georgius Rex, George the King
Gar. Garriſon
Gen. General
Gent. Gentleman
Goſp. Goſpel
Greg. Gregory
Hen. Henry
Hamp. Hamper
Hund. Hundred
Hum. Humphry
Heb. Hebrews
i. e. Id eſt, that is
I. H. S. Jeſus Hominum Salvator, Jeſus Saviour of Men
Id. Idem, the ſame
Inſt. Inſtance, or Inſtant
Ja. James, or Jacob
Jan. January
Jer. Jeremiah
Jeſ. Jeſus
Jn^{o}. John
Jud. Jugdes
Iſ. Iſaac
I'll, I will
Is't, is it
I'd, I had
I'm, I am
J. D. Jurium Doctor, Doctor of Law
Joſ. Joſhua
K. King
K^{m}. Kingdom
Kn^{t}. Knight
L. Lord
l. Liber, a Book
L. Libræ, Pounds
Lieu. Lieutenant
Lp. Lordſhip
Ladyſh^{p}. Ladyſhip
L. L. D. Legum Doctor, Doctor of Laws
Learn^{g}. Learning
Ln. London

L^{r}. Letter
Lam. Lamentations
Lev. Leviticus
Let's, Let us
M. Marqueſs, or Monday, or Morning
Mar. March
Mat. Matthew
m. Manipulus, a handful
M. A. Maſter of Arts
Ma^{ty}. Majeſty
M^{d}. Madam
Monſ. Monſieur
Math. Mathematician
Mr. Maſter
Mrs. Miſtreſs
M. D. Medicinæ Doctor, Doctor of Phyſick
M. S. Memoriæ Sacrum, Sacred to the Memory; alſo Manuſcript
Mich. Michael, or Michaelmas
Min. Miniſter
N. Note, or Nativity
Nat. Nathaniel, or Nativity
N. B. Nota bene, Note, or mark well
Nic. Nicholas, or Nicodemus
N. S. New Stile
N^{o}. Number
n. l. Non liquet, it appears not
Nov. or *9ber*, November
O. Oliver
Obj. Objection
Ob^{t}. Obedient
O. W. Old Word
O. S. Old Stile
Oct. or *8ber*, October
Oxon. Oxford
P. Paul, Paulus, Publius, or Preſident
Pugil, a Handful
Pen. Penelope

P^{d}.	paid
Par.	Pariſh
p.	per, or by
Pat.	Patience, or Patrick
Per C^{t}.	per Centum, by the Hundred
Parl.	Parliament
Pet.	Peter
Phil.	Philippians, or Philip
Philom.	Philomethes, a Lover of Learning
Philo-Math.	Philo-Mathematicus, a Lover of the Mathematicks
P. M. G.	Profeſſor of Muſic at Greſham College
Prof. Th. G.	Profeſſor of Divinity at Greſham College
Priſ.	Priſcilla
Pr.	Prieſt
Pſ.	Pſalm
Q.	Queen, or Queſtion
q.	quaſi, as if were
q. d.	quaſi dicat, as if he ſhould ſay
q. l.	quantum libet, as much as you pleaſe
q. ſ.	quantum ſufficit, a ſufficient Quantity
qr.	Quarter, or a Farthing
R.	Reaſon
R.	Rex, King; or Regina, Queen
Rev^{d}.	Reverend
Rev.	Revelations
Rich.	Richard
Rob^{t}.	Robert
Rog.	Roger
Ret.	Return
Reg. Prof.	Regius Profeſſor founded by K. Henry VIII.
Rom.	Romans
R^{t}. *Hon*^{ble}.	Right Honourable
R^{t}. *Worp*^{l}.	Right Worſhipful
S^{t}.	Saint
Sam.	Samuel
Sect.	Section
Sept. or *7ber*	September
Serj.	Serjeant
Serv.	Servant
Sh^{r}.	Shire
Shan't,	for ſhall not
Salop.	Shropſhire
Sol.	Solution
Staff.	Stafford
Sp.	Spain, or Spaniſh
S^{r}.	Sir
ſs.	Semiſſis, half a Pound
S. S. T. P.	A Profeſſor, or a Doctor of Philoſophy
Stew.	Steward
Tho.	Thomas.
Theſ.	Theſſalonians
The.	Theophilus
To.	Tobias
V.	Virgin, or Verſe
U.	Uſe
Vid.	ſee
Ven.	Venerable
Viz.	Videlicet, to wit, or that is to ſay
W^{m}.	William
W^{p}.	Worſhip
Wp^{l}.	Worſhipful
W. R,	William Rex
w^{n}.	when
X^{n}.	Chriſtian
X^{t}.	Chriſt
Xtopher,	Chriſtopher
y^{e}	the
y^{n}	then
y^{o}	you
y^{m}	them
y^{t}	that
y^{r}	your
Z.	Zeal
&,	et, and
&c.	& cetera, and the reſt, or, and ſo forth

And now having finiſhed my Directions concerning Spelling, Pointing, *&c.* I ſhall proceed to give ſome Inſtructions in relation to the moſt uſeful Art of Writing.

When any Perſon has thoroughly acquainted himſelf with Spelling, and underſtands good *Engliſh*, *&c.* the next Step neceſſary is the acquiring of the accompliſhing Art of fair Writing, to put this Spelling in Practice: In order thereto, I ſhall endeavour to give ſuch Directions, aud proper Inſtructions, as may duly qualify any Perſon therein.

Firſt, and principally, there muſt be a fixed Deſire and Inclination imprinted in the Mind for its Attainment: For I myſelf had never acquired, or arrived to any Proficiency in it, if I had not had a ſtrong Deſire and Inclination to it; riſing from being convinced of its excellent Uſe in Trade, and all manner of Buſineſs, according to the Verſe.

Great was his Genius, moſt ſublime his Thought,
That firſt Fair Writing to Perfection brought, &c.

Next to the Deſire, there muſt be added a ſteady Reſolution to go through with it, 'till it is gained; and by a diligent and indefatigable Application, overcome all ſeeming Difficulties, that may ariſe in the Progreſs of [illegible] Attainment, agreeable to this Diſtich;

By frequent Uſe, Experience gains its Growth;
But Knowledge flies from Lazineſs and Sloth.

DIRECTIONS *to* BEGINNERS.

FIRST, 'tis neceſſary to be provided with the following Implements, *viz.* good Pens, good and free Ink, and alſo good Paper, when arrived to commendable Performances; likewiſe a flat Ruler for Sureneſs; and a round one for Diſpatch; with a Leaden Plummet or Pencil to rule Lines: Alſo Gum Sandrick Powder, (or Pounce, as they call it) with a little Cotton dipp'd therein, which rub gently over the Paper, to make it bear Ink the better; particularly when full Hands are to be written, ſuch as Text, *&c.* and eſpecially when you are obliged to ſcratch out a Word or Letter; or then there will be a Neceſſity for its Uſe; and rubbing the Place with the Pounce, ſmooth it with the Haft of the Penknife, or clean Paper, and then you may write what is proper in the ſame Place. Theſe Implements are ſumm'd up in theſe Lines:

A Penknife Razor-Metal, Quills good Store ;
Gum-Sandrick Powder, to pounce Paper o'er ;
Ink, ſhining black ; Paper more white than Snow,
Round and flat Rulers on yourſelf beſtow,
With willing Mind, theſe, and induſtrious Hand,
Will make this Art your Servant at Command.

To hold the Pen.

THE Pen muſt be held ſomewhat ſloping, with the Thumb and the two Fingers next to it ; the Ball of the Middle Finger muſt be placed ſtraight, juſt againſt the upper Part of the Cut or Cradle, to keep the Pen ſteady: The Fore-finger lying ſtraight on the Middle-finger ; and the Thumb muſt be fixed a little higher than the End of the Fore-finger, bending in the Joint ; and the Pen be ſo placed, to be held eaſily without griping. The Elbow muſt be drawn towards the Body, but not too cloſe. You muſt ſupport your Hand by leaning on the Table-Edge, reſting on it, half way between your Wriſt and Elbow, not ſuffering the Ball, or fleſhy Part of your Hand, to touch the Paper ; but reſting your Hand on the End of your Little Finger, that and your fourth Finger bending inwards, and ſupported on the Table as aboveſaid. So fixed, and ſitting pretty upright, not leaning your Breaſt againſt the Table ; proceed to the making the ſmall *o*, the *a*, *c*, *e*, *i*, *m*, *r*, *s*, *w*, and *x* ; which muſt be all made of equal Bigneſs and Height, the Diſtance or Width between the two Strokes of the *n*, muſt be the ſame with the Diſtance or Width of the three Strokes of the *m* ; the ſame Proportion of Width muſt be obſerved in the *u*, *w*, and *o*. The Letters with Stems or Heads, muſt be of equal Height ; as the *b*, *d*, *f*, *h*, *k*, *l*, and *ſ*. And thoſe with Tails, muſt be of equal Depth, as the *f*, *g*, *p*, *q*, and *ſ*. The Capitals muſt bear the ſame Proportion one to another, with reſpect to Bigneſs and Height, as *A*, *B*, *C*, *D*, *E*, *F*, *G*, *H*, and *I*, *&c.*—This Proportion of Letters, both of Small and Great, muſt be obſerved in, and will ſerve for, all Hands whatſoever. *N. B.* That all upright Strokes, and thoſe leaning to the Left-hand, muſt be fine or hair Strokes ; and all downright Strokes, muſt be fuller or blacker. And when you are in Joining, where Letters will naturally join, without any ſtraining, take not off the Pen in Writing, eſpecially in Running or Mix'd Hands. Care likewiſe muſt be duly taken, that there be an

equa

equal Diſtance between Letter and Letter, and alſo between Word and Word: The Diſtance between Word and Word, may be the Space that the ſmall *m* takes up; but between Letter and Letter, not quite ſo much. Sit not long at Writing (that is, no longer than you improve) eſpecially at the firſt, leſt it weary you, and you grow tired of Learning. Imitate the beſt Examples; and have a conſtant Eye at your Copy; and be not ambitious of writing faſt, before you can write well: Expedition will naturally follow, after you have gained a Habit of writing fair and free; and 'tis much more commendable to be an Hour in writing ſix Lines well, than to be able to write ſixty Lines in the ſame Time, which perhaps is perfect Scribble, and altogether unintelligible And beſides, by a ſlow and fair Procedure, you will learn in half the Time: And therefore 'tis a vain Thought in a Learner, to deſire to be quick before he hath acquired Experience, and a Freedom of Writing by frequent Practice If you have Cotton in your Ink, look well that there be no Hairs at the Nib of your Pen. Never overcharge your Pen with Ink; but ſhake what is too much into the Ink again. When you leave off, keep your Pen or Pens in Water, 'till you come to your Writing again.

How to make a Pen.

THIS is gained ſooner by Experience and Obſervation from others that can make a Pen well, than by verbal Directions. But *Note*, That thoſe Quills call'd *Seconds* are the beſt, as being hard, long and round in the Barrel; and before you begin to cut the Quill, ſcrape off the ſuperfluous Scurff with the Back of your Penknife, and moſt on the Back of the Quill, that the Slit may be the finer, and without Gander's Teeth (as the Roughneſs in the Slit is by ſome called). After you have ſcraped the Quill as aboveſaid, cut the Quill at the End, half through, on the back-Part; and then turning up the Belly, cut the other half or Part quite through, *viz.* about a quarter, or almoſt half an Inch, at the End of the Quill, which will then appear forked: Then enter the Penknife a little in the back Notch; and then putting the Peg of the Penknife Haft, (or the End of another Quill) into the back Notch, holding your Thumb pretty hard on the Back of Quill, (as high as you intend the Slit to be,) then with a ſudden or quick Twitch, force up the Slit; it muſt be ſudden and ſmart, that

Slit may be the clearer: Then by ſeveral Cuts on each Side, bring the Quill into equal Shape, or Form, on both Sides: and having brought it to a fine Point, place the Inſide of the Nib on the Nail of your Thumb, and enter the Knife at the Extremity of the Nib, and cut it through a little ſloping: Then with an almoſt downright Cut of the Knife, cut off the Nib; and then by other proper Cuts, finiſh the Pen, bringing it into handſome Shape, and proper Form: But meddle not with the Nib again, by giving it any Trimming or fine Cuts; for that cauſes a Roughneſs, and ſpoils it: But if you do, to bring the Nib the evener, you muſt nib it again as above directed. ☞ *Note*, That the Breadth of the Nib muſt be proportioned to the Breadth of the Body, or downright black Strokes of the Letters, in whatſoever Hand you write, whether Small or Text. *Note alſo*, That in your ſitting to write, you place yourſelf directly againſt a fore-right Light, or elſe to have it on your left Hand (which I eſteem beſt) but by no Means to have the Light on your right Hand, becauſe the Shadow of your Writing-Hand will obſtruct your Sight, and therefore is very improper. And therefore, methinks, all Perſons in fixing up their Accounting Houſes, ſhould have a particular Regard to their Situation, in reſpect to what was before mention'd.

Thus far for Direction. Now for Application. I have here ſet Copies of the moſt uſual, faſhionable, commendable Hands for Buſineſs; with Alphabets of Great and Small Letters, proper to each. Be ſure you make your Letters well, (both Small and Great) before you proceed to joining. Be careful in Imitation, and obſerve the foregoing Directions, and without doubt you will gain your End. Command of Hand, or the Art of ſtriking Letters, *&c.* is gained by frequent practiſing after good Examples.

A B C D E F G H J I K L M N
O P Q R S T U V W X Y Z Æ

Z

a b c d e f g h j i k l m n o p

q r ſ s t u v w x y z &

N. B. 'Tis neceſſary for all thoſe who would qualify themſelves for Buſineſs, often to imitate this Print-Hand; to make clean Marks on Bales, or plain Directions on Parcels.

Copies in Proſe, and clinking, in Alphabetical Order.

A.

ART is gained by great Labour and Induſtry.
A covetous Man is always, as he fancies, in Want.
Add to your Faith Virtue, and to Virtue Knowledge.
A blind Man's Wife, they ſay, needs no Painting.
A comely Countenance is a ſilent Commendation.
A Place of ill Example may endanger a good Man.
A prudent Man values Content more than Riches.
A virtuous Mind is rather to be choſen than Promotion.
A fair Piece of Writing is a Sort of ſpeaking Picture.
All mundane Things run a continual Round.
Authority is the main Point in Government.
All God's Commandments keep moſt divinely pure.
A Man's Manners oft-times forms his Fortune.
A great Lyar is ſeldom believed, though he ſpeaks Truth.
All evil Things and vain, ſtrive ever to refrain.
A viruous-minded Youth, will ever love the Truth.
A prudent Youth and wiſe, will not Advice deſpiſe.
All you that would write well, ſtrive others to excel.
Abundance ruins ſome, but Want makes all to moan.
Amendment ſtill ſhould ſhine, in all and every Line.
A greater Loſs can't be, than that of Liberty.
A good and viruous Lad, will ſhun whate'er is bad.
Abundance proves a Snare, but moſt of Want are aware.
All Idleneſs avoid, by it moſt are deſtroy'd.
All idle lazy Boys, obſtruct their Parents Joys
A Man by Conduct may, keep Miſery away.
All Miſhap hath been occaſion'd by our Sin.
Avoid th'Occaſion ſtill, of running into Ill.
A Youth that would tranſcend, muſt ever mind to mend.
A Lad that would excel, muſt mind his Copy well.

B.

Bounty is commendable in ſome, but it ruins others.
By a commendable Deportment we gain Reputation.
By Delight, and ſome Care, we come to write fair.
By Diligence and Induſtry we come to Preferment.
Beauty without Virtue, is but a painted Sepulchre.
Beauty commands ſome, but Money all Men.
By conſtant Amendment we riſe to Preferment.
Brave Men will do Nothing unbecoming themſelves.
Be wiſe and beware; of Blotting take Care.

Bounty is more commended than imitated.
By Iniquity and Sin, Miſfortunes enter in.
By Idleneſs and Play, Youth ſquander Time away.
Barren are thoſe Joys, we waſte away in Toys.
Bleſs'd are their Joys above, who do their Time improve.
Badneſs brings all Sadneſs, therefore follow Goodneſs.
By truſting to To-morrow, Men plunge themſelves in Sorrow.
Be wiſe betimes; ſhun darling Crimes.

C

Contentment is preferable to Riches and Honour.
Can they be counted wiſe, who Counſel do deſpiſe.
Care mixed with Delight, will bring us ſoon to write.
Conſider the Shortneſs of Life, and Certainty of Death.
Contentment is a Gem, beyond a Diadem.
Competency with Content is a great Happineſs.
Contention and Strife, make uneaſy our Life.
Courtiers receive Preſents in a Morning, and forget 'em by
(Night.
Caution and Care, oft baffle a Snare.
Contentment makes a Man happy without a Fortune.
Cenſure no Man, nor detract from any Man.

D

Deride not Infirmities, nor triumph over Injuries.
Delight and ſome Care, will make you write fair.
Delight in Virtue's Ways, and then you'll merit Praiſe.
Death conquers potent Princes, and their Powers.
Delight in what you undertake to learn.
Duty, Fear, and Love, we owe to God above.
Death is before the old Man's Face, and may be at the
(young one's Back.
Death only can declare, what Duſt the Bodies of all Mortals
(are.
Drinking is the Drowning of Cares, not the Cure of them.
Death deſtroys not the Soul, but an ill Life does.
Do to others as you would, that they unto you ſhould.
Delay is the Remora to all good Succeſs.
Deprive no Perſon of his lawful Due, leſt they ſhould do
(the ſame by you.
Delight and Pleaſure's but a Golden Dream.
Death is leſs fear'd by a Fool than a Philoſopher.

E.

Endleſs Joys have thoſe, whoſe Sin are vanquiſh'd Foes.
Every Plant and Flower, ſhews to us God's Power.

Example oft doth rule, the wiſe Man and the Fool.
Examples oft prevail, when Arguments do fail.
Every idle Thought, to Judgment muſt be brought.
Every Sluggard is the Cauſe of his own Misfortune.
Envious Men do fret, when they ſee others get.
Evil Company makes the good bad, and the bad worſe.
Experience is the beſt Looking-glaſs of Wiſdom.
Even at Head and Feet, be ſure your Letters keep.
Endeavour to do well, and then you may excel.
Every Man is right, that mixes Profit with Delight
Evil Men and ſly, take care how you come nigh.
Envy and Care, make the Body grow ſpare.
Every money'd Man, hath others at Command.

F

Fair Words commonly dreſs foul Deeds.
Fair Faces have ſometimes foul Conditions.
Few do Good with what they have gotten ill.
Future Events muſt be left to Providence.
Fools are rul'd by their Humour, but wiſe Men by Intereſt.
Firm keep your Mind, on Things that are ſublime.
Fear is a good Watchman, but a bad Defender.
Fate will ſtill have, a kind Chance for the Brave.
Fraud in Childhood will become Knavery in Manhood.
Fear without Hope turns to Deſpair.
Faith and Hope are both dead when divided.
Fortune at ſome Hours to all is kind.
Feign'd Looks oft hide what the falſe Heart doth know.
Fortune and Fame, create a great Name.
Friends in Adverſity are not often found.
Fools and Knaves are not Companions for honeſt Men.
Frugality and Induſtry are the Hands of Fortune.

G

Godlineſs with Contentment is great Gain.
Good Manners in a Lad, will make his Parents glad.
Great Minds and ſmall Means ruin many Men.
Good Manners, Grace and Truth, are Ornaments in Youth.
Good Men as well as bad, have ſometimes Fortunes ſad.
Great Good you ſure will find, if you are well inclin'd.
Godlineſs hath the Promiſe of the Life that now is, *&c.*
God's Works only are perfect in their Kind.
Gluttony ranſacks *Noah*'s Ark for the Riot of a Meal.
Grief nouriſh'd in your breaſt, will never let you reſt.
Greater Profit doth always come of Learning than of Play.

Great Men tho' they ſhou'd, are not always good.
Good Men are ſafe when wicked ones are at odds.
Get what you get honeſtly, and uſe it frugally.
God is Omnipreſent, True, and Almighty.

H

Haſty Reſolutions are ſeldom fortunate.
Haſte makes Waſte of Paper, Ink, and Time.
He that ſtumbles, and falls not, mends his Pace.
Honour and Renown, will the Ingenious crown.
Hypocrites firſt cheat the World, and at laſt themſelves.
Human Life will human Frailties have.
Honour that is true, 'tis lawful to purſue.
He that ſends a Fool of an Errand, ought to follow him.
Honours are Burthens, and Riches have Wings.
He is a wiſe Security that ſecures himſelf.
He that ſins againſt Conſcience, ſins with a Witneſs.
Honour the hoary Head, that Virtue's Paths doth tread.
Happy are their Joys, who turn away from Toys.
Hours fly ſwift away; improve each Moment in the Day.
He that ſwims in Sin, muſt ſink in Sorrow.
He that fears not an Oath, will not tremble at a Lye.
He hath his Work half done, that hath it well begun.

I

Inſtruction, and a good Education, is a durable Portion.
Ignorance is the greateſt Enemy to Learning.
In praiſing ſparing be, and blame moſt ſparingly.
Imaginary Toys, do pleaſe ſome idle Boys.
Intemperance is attended by Diſeaſes, and Idleneſs with Want.
It is good to have a Friend, but bad to need him.
Idleneſs and Sloth, decreaſeth Learning's Growth.
Innocency need not fear the Lyon, or the rugged Bear.
It is better to be unborn, than untaught.
It's too late to ſpare, when the Bottom is bare.
Idleneſs hath no Advocate, but many Friends.
Improvement of Parts, is by Improvement of Time.
If you'd win a Pen of Gold, firſt learn well the Pen to hold.
It's the Work of an Age, to repair the Miſcarriage of an Hour.

K

Keep a cloſe Mouth, if you'd have a wiſe Head.
Kings, as well as mean Men, muſt die.
Kings may command, and Subjects muſt obey.
Kingdoms and Crowns muſt in the Duſt be laid.
Knowledge ſublime, is gained by much Time.

Keep at a Diſtance from Company that's ill.
Keep good Decorum in your Words and Deeds.
Keep cloſe your Intention, for Fear of Prevention.
Kings may win Crowns, but cannot conquer Death.
Keep Faith with all Men, and have a Care of a Lye.
Keep good Company, if you'd keep a good Name.
Knowledge, if abus'd, is like a Gem ill us'd
Kingdoms bring Care, and Crowns are heavy Things to wear,
Keep out evil Thoughts by entertaining good ones.
Kind Actions neglected, make Friendſhip ſuſpected.
Keep ſafe good Counſel, and entertain not ill Advice.
Kindle not Paſſion's Fire, it burns with dreadful Ire.

L.

Learn to live, as you would wiſh to die.
Love and Honour will bear no Rivals.
Learn to unlearn what you have learn'd amiſs.
Learn now in Time of Youth, to follow Grace and Truth.
Liberty is grateful to all, but deſtructive to many.
Lying is the Duty of none, but the Cuſtom of many.
Learning do but love, and then you will improve.
Liberality without Diſcretion, becomes Profuſeneſs.
Let no Jeſt intrude upon good Manners.
Learn now in youthful Prime, to huſband well your Time.
Learn how to make, as well as uſe a Pen.
Liberality ſhould have no Object but the Poor.
Loſt Opportunities are very rarely, if ever, recovered.
Let not the Work of To-day be put off 'till To-morrow.
Laugh not out of Meaſure, nor out of Seaſon.

M.

Money makes honeſt Men and Knaves, Fools and Philoſophers.
Monuments of Learning are the moſt durable.
Many know Good, but do not the Good they know.
Make uſe of Time, now whilſt you're in your Prime.
Money commonly corrupts both Church and State.
Many think not of living, 'till they can live no longer.
Money pleads all Cauſes, and defends all Titles.
Many, when they have fill'd their Bellies, complain of weak Stomachs.
Meaſure not Goodneſs by good Words only.
Marriage is out of Seaſon, if we are either too Young or too Old.
Moſt precious Time eſteem, which no one can redeem.

Many live Beggars all their Lives, that they may not die ſo.
Money makes ſome Men mad, many merry, but few ſad.
Many are led by the Ears more than by the Underſtanding.
Moſt precious Things are ſtill poſſeſs'd with Fear.
Many are made Saints on Earth that never reach Heaven.
Men of Intrigue commonly ſail with all Winds.
Money anſwers all Objections, and removes all Scruples.
Money and Poverty make great Knaves and little ones.
Misfortune is the Touchſtone of Friendſhip.
Marriage, ſay ſome, breeds Cares and Cuckolds.
Mend your Manners, and that will mend your Fortune.
Many want Help that have not the Face to aſk it.
Momentary and vain, is all earthly Gain.

N.

Nothing is conſtant in this uncertain World.
Neceſſity is commonly the Mother of Invention.
Next to a good Conſcience, prefer a good Name.
None ſo high can be, as no Miſhap to ſee.
Nothing is ſo hard but Diligence may overcome.
No Taſk's too hard, when Heaven's the Reward.
None can lay himſelf under an Obligation to do ill.
Never lament or weep, for Loſs of what you cannot keep.
Noiſe and Talk without ſome Rule, doth indicate that Man a Fool.
Nature ſeldom changes with the Climate.
Never ſtudy to pleaſe others, and thereby ruin yourſelf.
Nature's oldeſt Law we find, is that we to ourſelves be kind.

O.

Opportunity neglected brings ſevere Repentance.
On preſent Time depends our future State.
Opus and *Uſus*, as we read, are ſometimes *Latin* for our Need.
Of what gives moſt Delight, we ſooneſt loſe the Sight.
Omitting doing Good, is a committing Evil.
Orators are more ſolicitous to ſpeak *well*, than to do ſo.
Our Sand doth run apace, and ſoon we end our Race.
Our Inclinations get the Rein, to gain a Point we ſhould reſtrain.
Our Minds muſt be cultivated, as well as our Plants.
Other People's Death ſhould be Memento's to our own.
Our early Care ſhould be, to live moſt piouſly.
Our Time of Life is call'd a Span, by which obſerve how frail is Man.
One falſe Step ſometimes prevents another.

P

Provide againſt the worſt, and hope for the beſt.
Poor Men want many Things, but covetous Men all.
Patience and Time run thro' the rougheſt Day.
Put to your Tongue a Bridle, that it talk not idle.
Pain, Diſgrace and Poverty, have frightful Looks.
Prayers and Provender hinder no Man's Journey.
Put not off the main Buſineſs of Life, to the very Article of Death.
Pain we can count, but Pleaſure ſteals away.
Poor Freedom is better than rich Slavery.
Patience is the Lord of the lean Meat of Adverſity.
Paſſion and Partiality govern in too many Caſes.
Perfection in this World, is Virtue; and in the next Knowledge.

Q

Quick Promiſers are commonly ſlow Performers.
Quietneſs and Content are Mates moſt exellent.
Qualify exorbitant Paſſions with Quietneſs and Patience.
Quiet Men have quiet Minds, and enjoy Content.
Quicken Learning with Alacrity and Delight.
Quarrelſome Perſons ſometimes meet with their Match.
Quot Homines tot Sententiæ, ſo many Men, *&c.*
Quills are made for Pens, and Pens for Letters.
Quietly learn to bear a Croſs; if we repine, it's to our Loſs.
Queſtions in Jeſt no ſerious Anſwers need.
Quench Paſſion's Heat; don't ſuffer it to reign.
Quantity with ſome is what they'd hit; but Quality prevails with Men of Wit.

R.

Remember your Duty to God, your Neighbour, and yourſelf.
Repentance comes too late, when all is conſumed.
Reaſon ſhould always guide, and o'er our Acts preſide.
Reputation is the Darling of human Affection.
Reſt continu'd long, makes Idleneſs grow ſtrong.
Rely on Virtue more than Blood, for that is what you ſhou'd.
Repent To-Day, To-morrow may be too late.
Reputation is like a Glaſs, when crack'd it will be crazy.
Reputation is gain'd by many Actions, and loſt by one.
Remember Death, and do not forget Judgment.
Religion in Hypocrites, is as it were but Skin deep.
Relations and Friends, purſue their own Ends.

Religion hath and doth give Countenance to much Wickedneſs.
Riches ſerve a wiſe Man, and rule a Fool.
Run no great Riſque for 'vantage ſmall, tho' ſome for Money hazard all.
Reaſon's Dictates follow ſtill ; which if you do, *you'll* ne'er do *ill.*
Righteous Mens Prayers *ſhall* be regarded.
Repentance is a quite forſaking Sin ; but he repents not that remains therein.
Reſolve to amend, and purſu't to your End.
Review the Time you have miſpent ; think upon it, and lament.
Recreation ſhould fit us for Buſineſs, not rob us of Time.

S.

Sin and Sorrow are inſeparable Companions.
Some are too ſtiff to bend, and too old to mend.
Some *willinglier* diſcharge a Reckoning, than pay a Debt.
Sin is moſt certain, firſt Cauſe of Misfortune.
Study to live quiet, and to do your own Buſineſs.
Some in their Zeal are hot, but Knowledge they've not.
Set Bounds to Zeal by Diſcretion.
Silence is the Sanctuary of Prudence and Diſcretion.
Sloth is an Argument of a mean and degenerate Mind.
Short, and therefore vain, is *all* earthly Gain.
Soft Words, ſometimes, work upon the proudeſt Heart.
Sleep and Idleneſs are Enemies to Learning.
Sin is the Cauſe of Shame ; who love it are to blame.
Small Means and large Minds, ruin many Men.
Short are *all* Extreams, whether of good or *ill.*
Spend Time in good Duties, and Treaſure in good Works.
Some go fine and brave, finely to play the Knave.
Six Foot of Earth, ends *all* Diſtinctions of our Birth.
Some muſt die, that others may live, ſaid the Grave-digger.
Silly People are commonly *pleas'd* with *ſilly* Things.
Some are full of *oral* Sanctity, and *mental* Impiety.
Small Profit comes from *all ungodly* Gain.

T.

Train up a Child in the Love and Practice of good Manners.
The End of Mirth is many times the Beginning of Sorrow.
Time is ſo ſwift of Foot that none can overtake it.
Time paſſeth ſwift away, no Mortal can it ſtay.
Time paſſeth ſwift away, improve therefore each Day.
The doing nothing, is very near doing Evil.

Thoſe who won't 'mend To-day, *ſhall* have more Work
[To-morrow.
The Borrower is a Slave to the Lender; and the Security a
[Slave to both.
Truth is the ſtrongeſt Band of human Society.
The Endowments of the Mind ought not to be confin'd.
There's no diſcerning Pate, that can contend with Fate.
The Deſtruction of the Poor is their Poverty.
The City cares not what the Country thinks.
To do good, is the Way to find it. 1750.
'Tis juſt ſo much loſt as is idly ſpent.
There is no ſuch Thing in Nature as Perfection.
Time, Tide, and Carriers, *will* for no Man ſtay.
The Unfortunate are inſulted by every Raſcal.
'Tis inhuman to ſport with another's Infirmities.

V.

Virtue is firſt to be ſought for, and Money the next.
Vain and tranſitory, is all mundane Glory. 1750.
Virtue and Fortune work Wonders in the World.
Value more a good Conſcience than a great Fame.
Unwillingly go to *Law*, and *willingly* make an End.
Underſtanding a Thing is half doing it.
Variety is the Happineſs of Life.
Virtuous and brave Actions gain Reputation.
Uſe ſoft Words and hard Arguments.
Virtue is commended of *all*, but *follow'd* by few.
Unthankfulneſs is the Cauſe of the Earth's Unfruitfulneſs.
Vain Conceitedneſs is ridicul'd by *all*.
Virtue is ſeldom found a Match for Power.
Underſtand Things not by their Form, but Quality.
Virtue *all* commend, but few do it attend.
Union and Peace, make Diſcord to ceaſe.
Valour and Greatneſs, are preferr'd before Neatneſs.
Vain and fooliſh Things, Diſreputation brings.
Virtuous Actions *will* bring Reputation *ſtill*.

W.

What is more vain than publick Light to ſhun.
Who fears no bad, ſtands moſt unarm'd to *ill*.
What pleaſes God muſt be: none alters his Decree.
We are many Times deceiv'd with the bare Shew of Good.
Women and Wine, tho' they ſmile, they make Men pine.
When Fortune knocks, be ſure to ope the Door.
Wine is a Turn-coat; firſt a Friend, then an Enemy.

What is violent is ſeldom permanent. *l* 4. 16. 9.
When good Cheer is lacking, our Friends *will* be packing.
We dance *well*, whilſt Fortune plays on the Muſick.
We keep a better Account of our Money than our Time.
Wickedneſs in Jeſt leads us to Wickedneſs in Earneſt.
We muſt not blame Fortune for our own Faults.
Where Knavery is in Credit, Honeſty is put out of Countenance.
We muſt *look* to Time paſt, to improve what's to come.
What is fixed in our Hearts, is ſeldom out of our Heads.
Wickedneſs comes on by Degrees, as *well* as Virtue.
Would you be rich, be induſtrious; if wiſe, be ſtudious.

X.

Xenophon was a great Captain, as *well* as a Philoſopher.
Xerxes wept at the Thoughts that his vaſt Army would be dead in 100 Years.
Xerxes whipt the Sea becauſe it would not obey his Command.
Xenocrates, tho' a Philoſopher, was very *dull* and *heavy*.
Xenophilus liv'd without Sickneſs one hundred and ſeven Years.
'Xamples of the beſt for ever mind, and imitate in Kind.
'Xpel bad Thoughts, and what is Sin, forth of your Mind, and let what's good come in.
'Xamine *well* how you improve, for that will be as you your Learning love.
'Xerciſe will much Improvement gain.
'Xperience is the Miſtreſs of all Arts and Sciences.
'Xcel in what you can, and ſtrive to lead the Van.
'Xpreſs your Deſire to learn by your Diligence.

Y.

Youth is full of Diſorder, and Age of Infirmity.
Young Men lament, your Minutes miſpent.
Your Time improve, and ſquander't not away.
Your Spelling mind, and Senſe of what you write.
Yield quietly to what muſt come unavoidably.
Young Men in Strength ſhould provide againſt Age and Weakneſs.
Youth in their Prime, ſhould manage *well* their Time.
Youth to the Grave do go, as *well* as the Aged do.
Yield yourſelf Servant to Righteouſneſs and to Holineſs.
Your Copy mind, write fair, and of Blotting beware.
Your Care ſhould appear by writing moſt fair.
Your Delight and your Care will make you write fair.

Z.

Zeal in a good Cauſe, commands Applauſe.
Zeal mixt with Love, is harmleſs as the Dove.
Zealouſly ſtrive, with Emulation write.
Zealouſly ſtrive for an eternal Crown.
Zeno was the firſt of the Stoic Philoſophers.
Zeal without Knowledge is but Religious Wild-fire.
Zaccheus he was low, but yet his Faith wa'n't ſo.
Zeal, if not rightly directed, is very pernicious.
Zealouſly bend amain, fair Writing to attain.

Short Lines for Text-Hand.

Abandon whatſoever's ill—Be wiſe betimes.
Care deſtroys the Body—Do the Things that are juſt.
Expect to receive as you give—Frequent good Company.
Give what you give chearfully—Have good Men in Eſteem.
Imitate that which is good—Keep God's Commandments.
Learn to be wiſe—Money anſwers all Things.
Nothing get, nothing have—Obſerve Modeſty.
Pleaſures are very ſhort—Pains are very long.
Quit all Revenge—Quiet your Paſſions.
Recompenſe a good Turn—Repent of your Sins.
Spare for to live—Sin very little.
Time will improve—Turn from your Sins.
Uſe moderate Pleaſure—Uſe not bad Company.
Vain are ſome Pleaſures—Vile are ſome Vulgar.
Wiſdom is the principal Thing—Wiſe Men are ſcarce.
Xenophon and *Xenocrates*—*Zeno* and *Zenobia*.

Double Lines in Verſe.

All you that in fair Writing would excel,
How much you write regard not, but how well.
Bear your Pen lightly, keep a ſteady Hand,
And that's the Way, fair Writing to command.
Carefully mend in each ſucceeding Line,
For that's the Way to reach to what is fine.
Deſcending Strokes are dark, but upwards ſmall;
Even at Head and Feet keep Letters all.
From Blots keep clean your Book; and always mind
To have your Letters all one Way inclin'd.
Grace every Letter with perfect, full and ſmall.
And keep a due Proportion in them all.

Hold your Pen lightly, gripe it not too hard;
And with due Care your Copy well regard.
Join every Letter to its next, with Care,
And let the Stroke be admirably fair.
Keep a light Hand, and ſmoothly glide along;
Aſcending fine, and downward Strokes are ſtrong.
Let graceful Beauty in each Line appear,
And ſee the Front do not excel the Rear.
Majeſtick Grace, beautiful and ſtrong,
Doth, or elſe ought, to every Line belong.
No rough Edges ever ſhould be ſeen;
But all the Letters ſhould be ſmooth and clean.
On Care depends the Beauty of each Line,
For that alone will make your Art to ſhine.
Praiſe is deſerving to the careful Hand,
But to the Unthinking, doth Correction ſtand.
Quit yourſelf nobly, with a prudent Care,
Of clumſey writing, and of Blots beware.
Remember ſtrictly what the Art enjoins,
Equal ſiz'd Letters, and as equal Lines.
Small Letters muſt of equal Height be ſeen;
The ſame of Great; both beautifully clean.
Time and Delight will eaſy make the Taſk:
Delight, Delight's the only Thing I aſk!
Vain are the Hopes of thoſe that think to gain
This noble Treaſure, without taking Pain.
Whilſt idle Drones ſupinely dream of Fame,
The induſtrious actually do get the ſame.
'Xamples of the beſt, with Emulation ſtrive
To imitate, and then your Name'll ſurvive.
Youth is the Time for Progreſs in all Arts;
Then uſe your Youth to gain moſt noble Parts.
Zeal for Attainment of each Art ſhould burn
With fervent Warmth, then to Account 'twill turn.

Since good Ink is neceſſary to good Writing, I ſhall give a Receipt or two for making ſome of the beſt Black Ink in the World, which is as follows, *viz.*

A Receipt for black Ink.

TO ſix Quarts of Rain or River Water (but Rain Water is the beſt) put one Pound and a half of freſh blue Galls of *Aleppo* (for thoſe of *Smyrna* are not ſtrong enough, bruiſed pretty ſmall; 8 Ounces of Copperas, clean, rocky, and green; alſo 8 Ounces of clean, bright, and clear Gum Arabick; and 2 Ounces of Roche Allom: Let theſe ſtand together in a large Stone Bottle, or clean Stone Pot, or Earthen Pot, with a narrow Mouth to keep it free from Duſt; ſhake, rowl, or ſtir it well, once every Day, and you will have excellent Ink in about a Month's Time; and the older it grows, the better it will be for Uſe.

Ingredients for a Quart.

1 Quart of Water, 4 Ounces of Galls, 2 Ounces of Copperas, and 2 Ounces of Gum, mixed and ſtirred as above.

☞ If you ſoak the green Peeling of *Wallnuts* (at the Time of the Year when pretty ripe) and Oak Saw-duſt, or *ſmall* Chips of it, in Rain Water, and ſtirr'd pretty often for a Fortnight, and then ſtrain'd, and the Water uſed with the ſame Ingredients as above, the Ink *will ſtill* be ſtronger and better.

How to make Red Ink.

TAKE 3 Pints of Stale Beer (rather than Vinegar) and 4 Ounces of Ground *Brazil*-wood; ſimmer them together for an Hour; and then ſtrain it thro' a Flannel, or, *&c.* then bottle it up (well ſtopped) for Uſe.

Or you may diſſolve half an Ounce of *Gum-Stennega*, or *Arabick*, in half a Pint of Water; then put a Pennyworth of *Vermillion* into a ſmall Gallipot, and pour ſome of the Gum-Water to it, and ſtir it well, and mix it together with a Hair-pencil, to a proper Conſiſtency; but it will not incorporate preſently, but by the next Day it will; then having a clean Pen, dip it into the Ink, having firſt well ſtirred it with the Pencil, and then you may uſe it: It is a fine and curious Red, tho' not ſo free as the other. And after the ſame Manner, you may make any other coloured Ink, as Blue, Green, Yellow, Purple, *&c.* having divers Gallipots for that Uſe. In like manner you may mix the *Shell-Gold*, for curious Occaſions, pouring two or three Drops, according to Direction, into the *Shell*, and mix it *well* with a clean Hair Pencil, and with it put a little into a clean Pen, *&c.* The *ſmall Shells* may be bought at ſome *Fan-ſellers*, or *Fan-painters*, at two or three for Two-pence; or the large ones (which are the beſt) at the *Colour-ſhops*, at Six-pence a-piece.

To keep Ink from Freezing or Moulding.

IN hard Froſty Weather, Ink *will* be apt to freeze; which if once it doth, it *will* be good for nothing; for it takes away all its Blackneſs and Beauty. To prevent which (if you have not the Conveniency of keeping it warm, or from the Cold) put a few Drops of Brandy, or other Spirits, into it, and it will not freeze. And to hinder its Moulding, put a little Salt therein.

Familiar Letters on ſeveral Occaſions, and on divers Subjects.

BEFORE we enter upon *Arithmetick*, it may be proper to give ſome Examples of Letters on various Subjects, and upon divers Occaſions; which Letters frequently read over, and ſometimes copied, it may be a good Introduction to a handſome Style of Senſe, and to a commendable Manner of Writing; beſides the Help and Uſe they may be of in noting and obſerving the Method of Spelling good *Engliſh*, and Orthographically placing *Great Letters*, or *Capitals*, where they ought to be; and alſo in imprinting in the Mind the due Notion of Points, Stops, *&c.* and when and where to be made.

Letters are variouſly worded, and ought properly to expreſs the Deſires, Thoughts, *&c.* of the Writer to the Reader, that thereby the Receiver of the Letter may *fully* underſtand, and be juſtly inform'd of the Occaſions, Wants, or Intentions of the Sender.

Letters being writ on divers Subjects, and on ſundry Occaſions, they may be ranked under theſe Denominations, or ſeveral Heads following, *viz. Letters of proffered Aſſiſtance, Letters Conſolatory, Letters of Thanks, Letters Congratulatory, Ditto of Reproof, Ditto of Excuſe, Ditto Accuſatory, Ditto of Advice or Counſel, Ditto of Recommendation, Ditto Exhortatory, Ditto of Remonſtrance, and Letters of Viſit, properly called Familiar Letters, Letters of Buſineſs*; and laſtly, *Mixed Letters, that is, on various Subjects, and different Affairs.*

I ſhall not have Room to touch upon every one of theſe particularly; but I ſhall give ſundry Examples promiſcuouſly exhibited, and are ſuch as theſe that follow, *viz.*

A Letter from a Son to his Father.

London, 6th Dec. 1749.

Honoured Father,

WITH all dutiful Reſpect, I trouble you with theſe Lines, to enquire of the good State of your Health (of which I ſhall be extremely glad to hear) and to preſent you my moſt humble Duty, and Tenders of filial, and moſt affectionate Service. I have not had the Favour of any Letter from you ſince that from you dated the 8th of *October* laſt, which I reply'd to the very next Poſt, and in ſuch Particulars as you enjoined me. I have ſent you, Sir, by *Samuel Simple*, the *Pemſey* Carrier, a Spaniel Dog, which is an excellent good one of his Kind, and fit for the Sport of your Place; his Name is *Tray*, and is very free for the Water; and if he hath any Fault, it is being a little too eager; but he is young, and may be brought to what you pleaſe to have him. I hope my Siſter *Mary* is well, to whom pray give my kind Love, and alſo be pleaſed to accept of my Duty to yourſelf, which is the Preſent needful from,

Sir, your moſt dutiful Son,

and humble Servant,

Anthony Addlehill.

The Anſwer.

Pemſey, 28th Xber. 1749.

Dear Toney,

I Received your Letter of the 6th Inſtant, and I take Notice of your dutiful Reſpect and kind Wiſhes for my Health, which, I thank God, I perfectly enjoy at preſent, as I wiſh and hope you do yours.—I received your Preſent of the Dog; but the poor Cur was almoſt ſtarv'd, having (as I ſuppoſe) had nothing on the Road; but he is now in good Condition, and hath been tried as to his Mettle, and find he is a good one. I have ſent you by the Carrier half a Dozen wild Ducks, which *Tray* fetch'd when I had ſhot them. Your Siſter *Molly* remembers her kind Love to you, and hath ſent you a Turkey, and a Chine of Bacon, to which I wiſh you (and your Friends, if you invite any) a good Stomach. With my Bleſſing and Prayers to God for you, concludes your tender and very

Loving Father,
Andrew Addlehill.

P. S. We have a great many Wild-Fowl in our *Level*, ſo that you may expect another Preſent of that Kind in a little Time.

Note, *That theſe four ſhort Lines are called the Poſtſcript; becauſe they are writ after, when the Body of the Letter is done.*

A Letter from a Young Man to his Uncle.

Honoured Uncle, *Norwich, Dec.* 7, 1749.

SIR,

THE many kind and courteous Things that you have done for me, oblig'd me, in Point of Gratitude, as *well* as Duty, to return you my moſt humble Thanks, and to offer you my poor, but real and hearty Service, in the Affair between you and Mr. *A. B.* of this Place: And, if *you'll* pleaſe but to communicate to me your Intentions, and give me your Directions therein, I ſhall obſerve and *follow* them with all Punctuality; and will from Time to Time give an exact Account of my Negociations in that Affair. So, expecting to receive your Commands by the firſt convenient Opportunity, I reſt and remain,

Sir, your moſt obliged Nephew,
and very humble Servant
Brian Bing.

The Uncle's Anſw[illegible]r.

London, 12 *Dec.* 1749.

Nephew,

I Take your Offer of Service to me in the Buſineſs between me and Mr. *A. B.* of your City very kindly, and think none fitter to adjuſt that Affair than yourſelf; but I am *unwilling* to go to Law, and had rather, much rather, that you would endeavour to bring him to ſome reaſonable Accommodation; for in ſuch Conteſts the Winner is a Loſer at the Upſhot. So if I can bring him to any reaſonable Terms, I *ſhall* be very glad; You underſtand the Affair, and ſo I *ſhall* commit it *wholly* to your diſcreet and good Management, being perſuaded that you'll do for me as for yourſelf: So I remain your Loving,

And Affectionate Uncle,

Bazil Bing.

A Letter from a Niece to her Aunt.

London, 7th Dec. 1749.

Madam,

THE Trouble I have already given you, puts me to the Bluſh, when I think of intruding again on your Goodneſs; but Neceſſity, that frequently puts us upon what we have not always a Mind to, and forces us againſt our Inclinations, is now the Motive that induces me to be thus troubleſome. Pray, dear Madam, excuſe me, if I once more beg your Aſſiſtance in this Time of my unlucky Misfortune, and I ſhall ever have a grateful Remembrance of your Goodneſs to me; and I hope I *ſhall* be one Time or other in a Capacity of making ſome Returns of the many Obligations your Goodneſs hath conferred upon me your moſt reſpectful Niece,

And humble Servant,

Penelope Pinch.

A Letter of proffer'd Aſſiſtance to a Friend.

Dear Friend,

I Should be falſe to true Friendſhip, if I ſhould neglect or caſt off my Friend in Adverſity; I hearing that you are under ſome Misfortune, and, at preſent ſomewhat pinch'd with Want, I ſend you theſe Lines for your Conſolation, deſiring you to bear up againſt your ill Luck with as much Preſence of Mind as you can; for aſſure yourſelf, I ſhall ſuddenly follow this Epiſtle in Perſon, and come, I hope, opportunely enough to your Aſſiſtance; 'till which Time, take Courage, and be aſſured that you ſhall not be diſappointed of timely Help from, dear Friend,

Yours in reality,

Timothy Timely.

A Brother to a Siſter.

Dear Siſter,

THE great Diſtance and long Abſence of me from you (tho' I have not wanted good Company) makes me very ſolicitous concerning your Welfare: Natural Affection inclines me ſtrongly to have you in Remembrance, tendering your Health and Welfare in every reſpect as dear as my own; and there is nothing at my Command, but, if you requeſt, it ſhall be freely yours. Notwithſtanding the Diſtance, I purpoſe (God willing) to make you a Viſit very ſhortly, and had done it before now, but an urgent Occaſion interpos'd, the Particulars of which being too long for a Letter, I ſhall acquaint you of when I ſee you: Pray give my due Reſpects to all Friends, particularly to honeſt Mr. *S. T.* and ſo in a hopeful Expectation of finding you all well at my Arrival, I conclude, and remain,

Dear Siſter,
Your affectionate Brother,
and humble Servant,
Henry Hearty.

A Letter from a Youth *at School, to his Parents.*

London, 6th Dec. 1750.

Honoured Father and Mother,

I Received your kind Letter of the 4th of *November* paſt, and alſo the ſeveral Things therein mentioned, by the *Chicheſter* Carrier, for which I return you my moſt humble and hearty Thanks, they coming very ſeaſonably to the Relief of my Occaſions.—I begin to make pretty good Improvement in my Learning now (tho' at the firſt it ſeem'd a little irkſome and hard) and I hope to gain the Point at laſt, for which you ſent me hither. Pray, dear Parents, accept of my moſt-humble Duty to yourſelves, and kind Love pray remember to my Brothers and Siſters, and to my quondam *Playfellows, particularly* to *Jacky Jinglebrains*, and *tell* him, I hope by this Time he begins to be a little ſerious.—This being *all* at preſent from,

Honoured Parents,
Your dutiful Son, and humble Servant,
Stephen Studious.

From an Apprentice to his Friends.

Honoured Father and Mother,

BY theſe I let you know, that by your good Care and Conduct I am well ſettled, and am very *well* pleaſed with my Station, and could not but in Duty return you my hearty Thanks, in a grateful Acknowledgement of your Love and tender Care of me. I *will* endeavour to go thro' my buſineſs *chearfully*; and having begun *well*, I hope I *ſhall* perſevere ſo to do to the End, and that I may be a Comfort to you hereafter, and in ſome meaſure make a Return of your Love and Kindneſs to me, who am

Your moſt dutiful and obedient,
Son and Servant,
Daniel Diligent.

A Letter of Recommendation.

SIR,

THE Bearer hereof, *Francis Faithful*, I ſend to you as one whoſe Honeſty you may rely on, and my Experience of his Conduct and Fidelity gives me a certain kind of Confidence in recommending him to you; but you know me, Sir, and I believe you cannot in the leaſt think that I would recommend any one to you, that I had the leaſt Umbrage of Suſpicion or Doubt concerning their Probity. I am with due Reſpect,

Sir, your real Friend,
and humble Servant,
George Generous

A Daughter to a Mother, in relation to Marriag

Honoured Mother,

WITH all Duty, Humility and Reſpect, I addre myſelf to you in theſe Lines, hoping they will fi you in perfect Health both of Body and Mind, for whi I am never wanting in my Prayer to implore. As I wou act nothing that is very material, without your Knowledg Conſent and Approbation, I thought it my Duty to a quaint you of a Matter of the greateſt Weight and Impo tance, pardon me if I bluſh to name it, *viz.* that of m Marriage: the Perſon (as I think) is well deſerving of m or one much better; it is Mr. *A. B.* of *C.* You know both him and his Character, *viz.* one ſober, diligent, and good humoured; but however I ſhall ſubmit to your good Pleaſure and Guidance in an Affair of ſuch momentous Concern, and remain,

Honoured Mother,
Your dutiful Daughter,
and very humble Servant,
Mary Modeſty.

To a Country Chapman.

Mr. Francis Fairdealer, *London,* 8*th Dec.* 1750.

SIR,

YOU and I have formerly had Trading together, and it is not my Fault that we do not continue ſo to do; for aſſure yourſelf, I have a great Value and Reſpect for you, and on that Account none ſhall be more ready to oblige you in what I may; and pray let us once more re-aſſume our Dealings together; and you ſhall find, that for any Goods you have Occaſion for in my Way, none *ſhall* uſe you more kindly than,

Sir,
Your real Friend and humble Servant,
Titus Tradewell.

A Letter of Congratulation.

SIR,

IF you were but ſenſible how much I am affected with the good and moſt acceptable News that I hear of your good Fortune, you would conclude, that the Joy that ſurprizes me for the ſame is equal to yours that enjoy ſo happy a Turn of Providence: I could expreſs myſelf further on this Theme, and enlarge exceedingly on ſo pleaſing a Subject; but let this at preſent ſuffice, *till* I have a more favourable Opportunity of expreſſing my Joy to you perſonally; in the Interim I am truly,

Sir,
Your ſincere Friend,
and very humble Servant,
Ralph Real.

A Letter of Enquiry of Health.

Hammerſmith, 9th Octob. 1750.

SIR,

NOT hearing from you in ſuch a length of Time as from the 11th of *June* laſt to this Time, I am therefore under a great Concern for you, leſt ſome Misfortune of Sickneſs, or ſome other Accident, hath happened to you, or to ſome one of your Family; my Uneaſineſs thereon occaſions my giving you the Trouble of theſe Lines, which I wiſh may find Things with you better than my Fears ſuggeſt; however, to put me out of Pain, be pleas'd to let me know the Certainty with what convenient Speed you can; and thereby you'll very much oblige, *Sir,*

Your cordial and real Friend,
and very humble Servant,
Peter Pitiful.

A Letter by way of Petition to a Friend.

Honoured Sir,

I Am uncertain whether my late Misfortunes have come to your Knowledge; however I moſt humbly preſume on your good Nature, being aſſured by ſundry Examples of your Compaſſion, that you *will* think of, and take pity on the Diſtreſſed; therefore, as an Object truly deſerving Compaſſion, I moſt humbly implore, and petition you to conſider the many Loſſes and Diſappointments that I have met with in my unlucky and wayward Fortune, which have reduced me to ſuch neceſſitous Circumſtances, that I cannot poſſibly proceed in my Affairs: You was pleaſed once to ſtile me your Friend, and ſo I was indeed; and ſo I would moſt certainly be now, and ſhew it by a ſignal Proof of Kindneſs, if our Circumſtances were changed, by ſtanding between you and Misfortune, and ſcreening you from the malevolent and inauſpicious Influences of croſs-grain'd Stars. I doubt not, Sir, but your Generoſity and Goodneſs is as great; and, I hope, with all Humility you will be pleaſed to interpoſe your good Offices, *&c.* between unlucky Fortune, and

Sir,

Your very humble Servant,
Lawrence Luckleſs.

A Letter of Friendſhip.

Dear Friend,

IT is now a long Time (as I account it) ſince you and I have had any mutual Converſe by Letter, which to me is a great Unhappineſs; and really, if Diſtance did not ſomewhat excuſe, I ſhould be apt to tax you with Unkindneſs; but however, perhaps you may not have the ſame Conveniency of Writing at your Place (for want of Poſtage) as we have at ours, and on that Account, I ſhall not inſiſt on your Infringement of Friendſhip, but the chief Purport of theſe is to enquire of your Welfare, and to have an Anſwer given to, *Sir,*

your real Friend,
and very humble Servant,
Kendrick Kindly.

A Letter of Correſpondence.

Sir,

YOURS of the 5th *ult.* is now before me; in anſwer to which, I poſitively declare, That Mr. *A. B.* hath not been with me to preſent the Bill of Exchange that you mention in your Letter of Advice to me, and therefore there can be no juſt Cauſe of Proteſt, or any other Charge, put on *Sir,* *Your humble Servant,*

John Innocent.

It is as proper to know how to ſubſcribe, and how to direct, as it is to write a Letter.

SUPERSCRIPTIONS.

To his moſt Excellent Majeſty; or, *To his moſt Sacred Majeſty*, &c. *To the Queen's moſt Excellent Majeſty*, &c.
To the Prince, *To his Royal Highneſs*, &c.
To the Princeſs, *To her Royal Highneſs*, &c.

To Spiritual Lords,

To his Grace the Lord Archbiſhop of Canterbury; or, *To the moſt Reverend Father in God*, &c.

To other Biſhops,

To the Right Reverend Father in God, &c.

To the Inferior Clergy,

To the Reverend Mr. A. &c. or, *To the Reverend Doctor*, &c.

To Temporal Lords,

To his Grace the Duke of, &c. or, *To the Right Honourable the Marquis of Hallifax*; *To the Right Honourable the Earl* *of Suſſex. To the Right Honourable the Lord Viſcount Aſhburnham.*

The Sons of Nobility

Muſt be dignified (tho' not immediate Heirs) with the Title of *Honourable*, as being their Due by Birth.

To a Baronet, *Honourable*, by Virtue of his Patent, or *Right Worſhipful*; and alſo to a Knight, *Right Worſhipful.* To an Eſquire, *Worſhipful*,—Every Privy Counſellor, tho' not a Nobleman, hath the Title of *Right Honourable.* All Embaſſadors have the Stile of *Excellency*; as hath alſo the Lord Lieutenant of *Ireland*, and the Captain-General of his Majeſty's Forces. The Lord Mayor of *London*, during his Mayoralty, hath the Title of *Right Honourable.* And the Sheriffs, during that Office, have the Title of *Right Worſhipful.* All Mayors of Corporations have the Title of *Eſquires*, during their Office.

For the Beginning of Letters.

To the King; *Sir*, or *May it pleaſe your Majeſty.*
To the Queen; *Madam*, or *May it pleaſe your Majeſty.*
To the Prince; *Sir*, or *May it pleaſe your Royal Highneſs.*
To the Princeſs; *Madam*, or *May it pleaſe your Royal Highneſs.*
To a Duke; *My Lord*, or *May it pleaſe your Grace.*
To a Ducheſs; *Madam*, or *May it pleaſe your Grace.*
To a Marquis; *My Lord*, or *May it pleaſe your Lordſhip.*
To a Marchioneſs; *Madam*, or *May it pleaſe your Ladyſhip.*
To an Earl, Viſcount, or Baron; *Right Honourable*, or *May it pleaſe your Lordſhip.*
To their Conſorts; *Madam*, or *May it pleaſe your Ladyſhip.*
To a Knight; *Sir*, or *Right Worſhipful*
To his Lady; *Madam*, or *May it pleaſe your Ladyſhip.*
To a Mayor, Juſtice of the Peace, Eſquires, *&c. Sir*, or *May it pleaſe your Worſhip.*

At ſubſcribing your Name conclude with the ſame Title you began with; as *My Lord, your Lordſhip*, &c.

Of Secret Writing.

HERE it may not be improper to ſay ſomething of Secret Writing; to which Biſhop *Wilkins*, in his Book of *Mathematical Magic*, ſpeaks largely; but it is principally concerning Writing in Cypher, which requires great Pains, and an uncommon ſhare of Ingenuity, both in Writers and Readers. But however I ſhall ſhew two or three particular Ways, that are very pretty and amuſing, and alſo very eaſy, both as to Coſt and Pains. And,

Firſt, if you dip your Pen in the Juice of a Lemon, or of an Onion, or in your own Urine, or in Spirits of Vitriol, and write on clean Paper whatever you intend, it *ſhall* not be diſcerned *till* you hold it to the Fire, and then it will appear legible. And if with any of the aforementioned, you write on your Skin, as on your Arm, and Back of your Hand, *&c.* it ſhall not be ſeen *till* you burn a Piece of Paper, and with the Aſhes rub on the Place, and then it *will* appear very plain: And this I have experienc'd and try'd, and therefore can ſay, *Probatum eſt.*

Another Way is, When you write a Letter that you intend it ſhall not be diſcovered, but to thoſe you think fit, firſt to write your Thoughts on one Side of your Letter with black Ink, as uſual, (but it ought to be on thin Paper) and then on the contrary Side, go over the ſaid Matter that you would have ſecret, with a clean Pen dipp'd in Milk; and that Writing *ſhall* not be read without holding it to the Fire, as mentioned above, and then it *will* appear *legible* in a bluiſh Colour.

A third Method is, to have two Pieces of Paper of equal Size, and the Uppermoſt cut in chequered Holes or Squares big enough to contain any Word of ſix or ſeven Syllables, and in thoſe Squares write your Mind in regular Senſe; and then take off the ſaid chequered Paper, and fill up the Vacancies with Words of any Kind, which will render it perfect Nonſenſe, and not capable of being read, to any Purpoſe of Intelligence. And tranſmit and ſend the ſaid uppermoſt, or chequered Paper, or another exactly of the ſame Form, to your Correſpondent; whereby he ſhall, by laying it nicely on your ſaid Letter, read your intended Senſe, without being perplexed with the Words of Amuſement intermixed, which makes it altogether unintelligible.

Or, again, you may write to your Friend in proper Senſe with common Ink, and let the Lines be at ſo commodious a Diſtance, that what you intend to be ſecret may be written between them with Water, wherein Galls have been ſteeped a little Time; (but not long enough to tincture the Water) and when dry, nothing of the Writing between the ſaid Lines can be ſeen; but when it is to be read you muſt with a fine Hair Pencil dipp'd in Copperas Water, go between the ſaid Lines, and ſo you make it legible. *Note*, This Way will give no Ground for Suſpicion, becauſe the Letter ſeemeth to carry a neceſſary Senſe in thoſe Lines that are ſet at ſuch a proper Diſtance, *&c.*

Of ARITHMETICK.

AFTER Writing, the next neceſſary Step towards qualifying a Perſon for Buſineſs, is the underſtanding that truly laudable and moſt excellent Accompliſhment, the noble Science of *Arithmetick*; a Knowledge ſo neceſſary in all the Parts of Life and Buſineſs, that ſcarce any thing is done without it.

In my Directions for its Attainment, I ſhall proceed with ſuch Plainneſs of Method, and Familiarity of Stile, as ſhall render it eaſy to be underſtood, and conſpicuous to the meaneſt Capacity.

And firſt of *Notation* and *Numeration*.

In *Notation*, we muſt note or obſerve, that all Numbers are expreſſed by, or compoſed of, theſe ten Figures or Characters following, *viz.*

One,	*Two,*	*Three,*	*Four,*	*Five,*	*Six,*	*Seven,*	*Eight,*	*Nine,*	*Cypher.*
1	2	3	4	5	6	7	8	9	0

Nine of theſe are called ſignificant Figures, to diſtinguiſh them from the *Cypher*, which of itſelf ſignifies nothing; but as it is placed (in whole Numbers) ſerves to increaſe the Value of the next Figure or Figures that ſtand before it; as 3 is but Three; but before the *Cypher* thus, 30, the 3 becomes Thirty, *&c.* But in Decimal Fractions, the (0) decreaſes the Value of the Figure behind it; for therein, 3 is three Tenths of any Thing; but by placing 0 before it, thus, 03, it is decreaſed from 3 tenth Parts, to three hundredth Parts of any thing, *&c.*——We are to note, That every one, or any, of the abovementioned nine Figures, or Digits, have two Values; one certain, and another uncertain; the certain Value is, when it ſtands alone by itſelf; the uncertain is, when joined or placed with other Figures or Cyphers; for when any one of theſe Figures ſtand alone, they ſignify no more than their own ſimple Value; as 5 is but Five, 4 but Four, 6 but Six, and 3 no more than Three, *&c.* And this is the certain Value of a Figure: But when another Figure or Cypher is annexed, they then are increaſed in their

Value ten Times; as 5, or 5 Units, or Ones, to 5 Tens or Fifty, 4 to 4 Tens or Forty, 6 to 6 Tens or Sixty, and 3 to 3 Tens or Thirty; as thus, 51, Fifty-one; 42, Forty-two; 63, Sixty-three; 34, Thirty four *&c.* Again, if any of the ſaid Figures ſtand in the third Place towards the Left-hand, they ſignify ſo many Hundreds as they expreſſed Units or Ones; as 500 is Five hundreds, 400 Four hundreds, 600 Six hundreds, and 300 Three hundreds, *&c.* If any of them poſſeſs the 4th Place towards the Left-hand, they are ſo many Thouſands as they contain Units: And ſo any, or every Figure, increaſes by a Ten-fold Proportion, from the Right-hand to the Left, according to the Place it is found or ſtands in; ſo that 5 may be but Five, or Fifty; Five hundred, or Five thouſand: In the firſt Place, 5; in the ſecond, 50; in the third, 500; in the fourth Place 5000, *&c.* And therefore, this is the uncertain Value of a Figure: But the true Value of Figures in Conjunction, may be fully learnt and underſtood by the following Table.

The Numeration Table.

C Thouſ. of M. 12	X Thouſ. of M. 11	Thouſ. of Mil. 10	C of Millions. 9	Tens of Mill. 8	Millions. 7	C of Thouſ. 6	Tens of Thouſ. 5	Thouſands 4	Hundreds 3	Tens 2	Units 1	Hund. Thouſ. of Mil.	Hundreds of Mil.	Hundreds of Thouſ.	Units or Ones
1	2	3	4	5	6	7	8	9	0	1	2	123	456	789	012
	1	2	3	4	5	6	7	8	9	0	1	12	345	678	901
		1	2	3	4	5	6	7	8	9	0	1	234	567	890
			1	2	3	4	5	6	7	8	9		123	456	789
				1	2	3	4	5	6	7	8		12	345	678
					1	2	3	4	5	6	7		1	234	567
						1	2	3	4	5	6			123	456
							1	2	3	4	5			12	345
								1	2	3	4			1	234
									1	2	3				123
										1	2				12
											1				1

For the eaſier Reading of any Number, firſt get the Wor
at the Head of the Table by Heart; as Units, Tens, Hun-

dreds, Thouſands, &c. and apply'd thus, 75, five Units, Five, and 7 Tens, Seventy, that is, Seventy-five. Again, 678; 8 Units, Eight; 7 Tens, Seventy; and 6 Hundreds, ſix Hundred; that is, ſix Hundred ſeventy-eight. Once more, 3456; 6 Units, ſix; 5 Tens, fifty; 4 Hundreds, four Hundred; 3 Thouſands, three Thouſand; together, Three thouſand four hundred fifty-ſix. Read the 4th Line of the Table downwards, *viz.* 123456789; here the Valuation of the Figures is from the Right-hand to the Left, as 1 in the ninth Place is Hundreds of Millions; but to be read from the Left-hand to the Right; thus, One hundred twenty-three Millions, four hundred and fifty ſix thouſand, ſeven hundred eighty-nine. But any Number may yet be read more intelligibly, *viz.* by Stops, thus; Make a Comma after every third Figure or Cypher, beginning at the Right-hand, and ſo on towards the Left, making a Stop after every third Figure or Cypher, as aboveſaid; thereby diſtinguiſhing every third Place into Hundreds, as Hundreds of Units, Hundreds of Thouſands, Hundreds of Millions, and Hundred Thouſands of Millions, &c. And for Trial, let's read the firſt Line of the Table; the laſt Place in Valuation is Hundred Thouſands of Millions, and to be pointed into Periods thus, 123,456,789,012; and read thus, One hundred twenty-three thouſand, four hundred fifty-ſix Millions, ſeven hundred eighty nine thouſand, and twelve; that is, no hundreds, but twelve. Again, read the following Number, *viz.* 276,245,678,921,460; here the firſt Point or Period is between 4 and 1, and the laſt between 2 and 6, and to be read thus; 276 Millions of Millions, 245 Thouſands of Millions, 678 Millions, 921 Thouſands, 460 Units, or Ones. And thus may any Number be read with eaſe, though a large one: And thus are large Numbers or Sums expreſſed, or ſet out in the Exchequer, Bank, Lottery-Tickets, &c. as thus, N° 224,156,—19,478,—and 420,000, &c. The foregoing *Table of Numeration* is on the Right-hand diſtanced out into Periods, for the eaſier reading thereof.

Numbers to be read or written, *viz.*

96, *Ninety-ſix.*
242, *Two hundred forty-two.*
7924, *Seven thouſand* 9 *hundred* 24.
54006, *Fifty-four thouſand and ſix.*
524707, *Five hundred* 24 *thouſand* 707.
4706240, *Four millions* 706 *thouſand* 240.
62700472, *Sixty-two millions* 700 *thouſand* 472.
474960204, *Four hundred* 74 *millions* 960 *thouſand* 204.
4214007042, *Four thouſand* 214 *millions* 7 *thouſand* 42.
44214800240, *forty-four thouſand* 214 *millions* 8 *hundred thouſand* 240.

Of Numerical Letters.

Sometimes Numbers are expreſſed by Letters; and it is neceſſary to underſtand them, for the readier reading the Dates of Years, frequently uſed at the Foot of Title Pages of Books, and on Funeral Monuments, and in Roman Hiſtory, *&c.*

I *ſignifies One.*
V *Five.*
X *Ten.*
L *Fifty.*
C *An Hundred.*
CC *Two Hundred.*
D *or* IↃ *Five Hundred.*
M *or* CIↃ *A Thouſand.*
IↃↃ *Five Thouſand.*
CCIↃↃ *Ten Thouſand*
IↃↃↃ *Fifty Thouſand.*
CCCCIↃↃↃↃ *A Hundred Thouſand.*
IↃↃↃↃↃ *Five Hundred Thouſand.*
CCCCCIↃↃↃↃↃ *Ten Hundred Thouſand, or a Million.*
M. DCC. L. *expreſſes this preſent Date of* 1750. M. *being One Thouſand,* D *Five Hundred,* CC *Two Hundred, and* L *Fifty; together One Thouſand Seven Hundred and Fifty.*

ADDITION

IS the putting together two or more Numbers or Sums, ſo as their total Value may be diſcovered or known.

Herein we muſt always obſerve to ſet the Numbers to be added, ordering one under the other; that is, Units under Units, Tens under Tens, Hundreds under Hundreds, *&c.* as in the ſubſequent Examples.

Addition

Addition of Numbers of one Denomination.

Yards.	*Gallons.*	*Pounds.*
T.U.	H.T.U.	X *of* Th.Th.H.T.U.
2 4	7 5 6	5 7 9 6 2
4 2	4 3 2	3 9 7 4 4
6 8	5 7 8	6 7 2 2 2
8 6	6 9 6	7 9 6 7 4
2 4	4 2 2	2 4 9 2
4 2	6 7 8	3 9 0
2 8 6	3 5 6 2	2 4 7 4 8 4

In Addition of ſimple Numbers, whether it be *Yards*, *Gallons*, *Pounds*, or any thing elſe, remember to carry 1 for every 10 that you find in the firſt Row or Rank of Figures, being Units, to the next Row of Tens; and the like from the Rank of Tens to the Row of Hundreds, *&c.* and whatever it makes in the laſt, you muſt ſet it down, amount to what it will.

The Numbers above are ſet down in Order, as before directed; that is, Units under Units, Tens under Tens, *&c.* as may be plainly underſtood, by being indicated at the Head of each Row, or Rank with Units, Tens, Hundreds, *&c.* Then in caſting up each Example, to know its Total, I begin at the Right-hand, or Unit's Rank, of the firſt Example, and ſay, 2 and 4 is 6, and 6 is 12, and 8 is 20, and 2 is 22, and 4 is 26; in which Row there are two Tens and 6 over; wherefore I ſet down 6 juſt under its own Rank, and carry 2 to the next or laſt Row, and ſay, 2 that I carry and 4 make 6, and 2 is 8, and 8 is 16, and 6 is 22, and 4 is 26, and 2 is 28; and it being the laſt Row, I ſet down the Amount, *viz.* 28; ſo that the Total Number of Yards is found to be (by this Method) at the Bottom 286. And the next or ſecond Example, is found by the ſame Method to be 3562 Gallons. And in the third and laſt Example, the Total Number of Pounds is found by the ſame Way to be 247484. And ſo the Total of any other Example of the ſame kind, *viz.* ſimple Numbers of one Denomination, may be found. *Note*, That when any of the Ranks amount to juſt 10, 20, 30, 40, 50, *&c.* then you muſt ſet down the 0, under its proper Rank, and carry either 1, 2, 3, 4, or 5, according to the Number of Tens that you find, to the next Row; and ſo you muſt always do, when it ſo happens, whether in the firſt, ſecond, or third Row; or in any other, except the laſt, where what it amounts to muſt be ſet down, without any Reſerve or Carriage in the Mind, becauſe there is no other Row or Rank to carry to, as was hinted before.

And ſo much for *Addition of Numbers of one Denomination*, which never varies from what has been ſaid above; obſerving ſtrictly to keep to the critical, and nicely ſetting down in perpendicular Order your ſeveral Numbers, that Units may preciſely and directly ſtand under Units, Tens under Tens, *&c.* as hath fully been declared before. The next in Order, of courſe, is *Addition of Numbers of ſeveral Denominations*; or *Addition of Money*.

As we in *England*, or *Great-Britain*, keep our Accounts in Pounds, Shillings and Pence, and Parts of a Penny; ſo you are to note, that

4 *Farthings make* 1 *Penny*,
12 *Pence* 1 *Shilling*, and
20 *Shillings* 1 *Pound.*

And here alſo you are ſtrictly to obſerve, and with the ſame Punctuality to mind, that Pounds be ſet directly under Pounds, Shillings under Shillings, Pence under Pence, and Farthings under Farthings; as in the Examples hereafter following.

But before you proceed, it will be neceſſary to have the following Tables by Heart, for the readier Knowledge how many Shillings there are in ſo many Pence, and apprehending how many Pounds are contained in ſo many Shillings, *&c.*

Pence		*s.*	*d.*
20	is	1	8
30	—	2	6
40	—	3	4
50	—	4	2
60	—	5	0
70	—	5	10
80	—	6	8
90	—	7	6
100	—	8	4
110	—	9	2
120	—	10	0

s.		*l.*	*s.*
30	is	1	10
40	—	2	0
50	—	2	10
60	—	3	0
70	—	3	10
80	—	4	0
90	—	4	10
100	—	5	0
110	—	5	10
120	—	6	0

The Uſe of theſe Tables is this; whenever you are caſting up any Example, or Sum of Money, you begin at the Right-hand (as before in Sums of one Denomination) the Place of Pence, and ſuppoſe the Rank, Row, or Denomination of Pence amounts, from the Bottom to the Top, to 56; then your Table of Pence tells you that 50 *d.* is 4 *s.* and 2 *d.* 6 over is 4 *s.* 8 *d.* If to 92 *d.* the Table tells you that 90 *d.* is 7 *s.* 6 *d* and 2 *d* over, is 7 *s.* 8 *d* And if to 81 *d.* the Table ſhews that 80 *d.* is 6 *s.* 8 *d.* and 1 *d.* more makes 6 *s.* 9 *d.* &c.

The *Shillings Table* ſerves to lead you to a quick Recollection how many Pounds there are in ſo many Shillings; as admit the Rank of Shillings ariſes to 57 *s* the Table ſays, that 50 *s.* is 2 *l.* 10 *s.* and 7 *s.* over makes 2 *l.* 17 *s.* If to 84 *s.* the Table declares, that 80 *s.* is juſt 4 *l.* and 4 *s.* over makes 4 *l.* 4 *s.* If to 112 *s.* the Table tells you that 100 *s.* is 5 *l.* and 12 *s.* more make 5 *l.* 12 *s.* &c.

Addition of Money.

Money owing, and Money received, as follows,

(1)

		l.	*s.*	*d.*
Ow. to	Mr. *Andrews*	4	12	6
	Mr. *Bent*	7	06	9
	Mr. *Crawley*	4	12	0
	Mr. *Dupper*	6	17	7
	Mr. *Edlin*	5	06	6
	Mr. *Franklin*	4	12	3
	Mr. *Gregory*	6	00	0
	Mr. *Fiſher*	5	15	4
		45	02	11

(2)

		l.	*s.*	*d.*
Rec. for	*Tobacco*	46	10	9
	Sugar	79	16	0
	Indigo	42	18	3
	Broad Cloth	66	12	4
	Canary	90	16	0
	Port-Wine	84	07	6
	Rice	24	12	0
	Logwood	60	10	0
		496	02	10

Note, That *l.* ſtands for Pounds, *s.* for Shillings, *d.* for Pence, and *qr.* for Farthings; in regard that *Libra* ſignifies a Pound, *Solidus*, a Shilling, *Denarius*, a Penny, and *Quadrans*, a Farthing.

I begin with the firſt Example of Money owing, and ſay, 4 and 3 is 7, and 6 is 13, and 7 is 20, and 9 is 29, and 6 makes 35 Pence; now 30 Pence, according to the Table is 2 *s.* 6 *d.* and 5 *d.* makes 2 *s.* and 11 *d.* I ſet down 11 exactly under the Rank of Pence, and ſay, 2 Shillings that I carry (which I do to the Rank of Shillings) and 5 is

7, and 2 is 9, (for I only take the Units Rank of Shillings) and 6 is 15, and 7 makes 22, and 2 is 24, and 6 is 30, and 2 makes 32; and now being come to the Top of the Sum, and it making 32, I come down with the Tens of Shillings, ſaying 32 and 10 is 42, and 10 is 52, and 10 is 62, and 10 is 72, and 10 makes 82 Shillings; and the Table telling me that 80 Shillings is 4 Pounds, I know therefore 82 *s.* is 4 *l.* 2 *s.* wherefore I ſet down the odd 2 *s.* juſt under the Row of Shillings, and carry 4 Pounds to the Pounds; ſaying, 4 that I carry and 5 is 9, and 6 is 15, and 4 is 19, and 5 is 24, and 6 is 30, and 4 is 34, and 7 is 41, and 4 makes 45 Pounds; ſo that the Total of thoſe ſeveral Sums of Money, due to thoſe ſeveral Perſons, amounts to 45 *l.* 2 *s.* 11 *d.* as in the Example.

In the ſecond Example of Money received, I begin at the Right-hand (as in all *Additions, Subtractions* and *Multiplications*, we do, and ought ſo to do, working from the Right-hand to the Left; but in *Diviſion* you begin the Operation at the Left, and work towards the Right,) and ſay, 6 and 4 is 10, and 3 is 13, and 9 makes 22; and 22 Pence being 1 *s.* 10 *d.* I ſet down 10, and carry 1 *s.* to the Shillings; ſaying 1 that I carry and 2 is 3, and 7 is 10, and 6 is 16, and 2 is 18, and 8 is 26, and 6 makes 32; then I come down with the Tens, ſaying, 32 and 10 make 42, *&c.* and find at the Bottom it comes to 102 Shillings; which making 5 *l.* 2 *s.* I ſet down 2 *s.* and carry 5 *l.* to the Pounds; ſaying, 5 that I carry, and 4 is 9, *&c.* I find that at the Top it amounts to 36, whereof I ſet down 6 exactly under its own Rank, *viz* the Rank of Units of Pounds, and carry 3 for the 3 Tens that are in 30, for at all Times in the firſt Denomination of Addition, whether of Money, Weight, or Meaſure; that is in the Denomination of Pounds, Tons, or Yards, you muſt caſt them up as Sums of one Denomination; that is, for every Ten carry One to the next, *&c.* ſaying, 3 that I carry, and 6 is 9, and 2 is 11, and 8 is 19, *&c.* and find that at the Top it comes to 49; wherefore I ſet down 49 before the 6; and the Total Amount of the Money received for thoſe particular Goods or Wares ſold, is 496 *l.* 2 *s.* 10 *d.*

More Examples for Practice.

		l.	s.	d.	10	20	124	l.	s.	d.
Money due from	Mr. *Money*	17	12	6¼	*l.* 146	12	3½	4	10	6
	Mr. *Gaunt*	26	10	2	278	10	9	0	07	9
	Mr. *Hern*	50	00	0	46	16	6	1	00	0
	Mr. *James*	44	12	8½	100	00	0	1	01	0
	Mr. *King*	60	14	0	72	12	4	0	04	6
	Mr. *Long*	29	16	6¾	69	16	6¾	0	10	0
	Mr. *Monk*	16	10	0	460	12	6	4	14	4
	Mr. *Napper*	20	00	0	49	10	0	0	07	6
	Mr. *Oliver*	27	11	4½	7	12	4½	0	01	6
	Mr. *Perkins*	17	04	0	22	10	0	0	02	6
	Mr. *Quinton*	20	10	3	164	12	9	3	10	9
	Mr. *Roper*	46	16	8	75	10	6	1	10	0
	Total	377	18	3	1494	16	6¾	18	00	4

Over the middle Example there are Numbers ſet, to denote what you muſt ſtop at, if you cannot caſt it up without.

Addition of Avoirdupois Weight.

By this Weight are weighed all Kinds of *Grocery* Goods or Wares, or Goods ſubject to waſte; as *Tobacco*, *Sugars*, *Fruit* and *Drugs*, as alſo *Butter*, *Cheeſe*, *Allom*, *Tallow*, *Fleſh*, *Iron*, *Braſs*, *Copper*, *Lead*, *Tin*, or *Pewter*, *Pitch*, *Tar*, *Reſin*, *Hemp*, *Flax*, *Soap*, *Salt*, and all Kind of *Garbled Goods*; that is, thoſe Goods that have Duſt, Droſs, or Waſte.

A Table of this Weight is as follows, *viz.*

		Marked.
4	Quarters *make* 1 Dram	*dr.* Drams
16	Drams 1 Ounce	*oz.* Ounces
16	Ounces 1 Pound	*lb.* Pounds
28	Pound 1 qr. of a hundred Weight, or 112 *lb.*	*qrs.* Quarters.
4	Quarters 1 Hundred Wt.	*C.* Hundreds
20	Hundred Wt. 1 Tun	*T.* Tuns

28 *C. qrs. lb.*	10 4 28 *C. qrs. lb.*	28 *C. qrs. lb.*	*Small Weight.* 10 16 16 *lb. oz. dr.*
5—1—16	24—1—12	9—1—16	24—11—12
4—2—24	42—2—00	4—3—26	42—14—15
6—3—06	16—1—12	7—1—00	64—10—11
7—1—12	25—3—24	5—3—27	29—09—10
9—0—20	19—0—20	4—3—00	16—12—13
6—2—00	26—1—22	2—2—02	27—13—14
39—3—22	154—3—06	34—3—15	206—09—11

In the firſt of theſe Examples, I begin at the Right-hand, to wit, at the Denomination of Pounds, and ſtop at every 28, ſo many Pounds making a Quarter; that is, at every 28 I make a Speck on my Nail, (not in the Sum, for that Way is not proper or handſome) and I find two 28's, and 22 *lb.* over; wherefore I ſet down 22, and carry 2 *qrs.* to the Quarters, and adding them up, find them 11, which is 2 Hundred, and 3 *qrs.* over; wherefore I ſet down 3, and carry 2 to the Hundreds; which alſo added up, make 39; ſo that the Total Weight is 39 *C.* 3 *qrs.* and 22 *lb.* &c.

And for the Example of *Small Weight*, there I ſtop at 16 and 16, and at 10 in the Pounds, and find the Total 206 *lb.* 9 *oz.* and 11 *Drams.* There's no occaſion for ſtopping but only at 28 in the Great Weight, and at 16 and 16 in the Small.

☞ *Note,* That in Weighing at the Water ſide, or elſewhere, they do not weigh by the Ton in *Great Weight*, though ſome Goods are ſold by it, as *Iron*, *Logwood*, *Cheeſe*, &c. but by Hundreds, Quarters, and Pounds, and afterwards computed by Tons, *&c.*

Addition of Troy Weight.

By this Weight are weighed, *Jewels*, *Gold*, *Silver*, *Pearl*, *Electuaries*, and *Liquors*; a Pint of Water, Wine, *&c.* being a Pound, and the uſual Denominations are *Pounds*, *Ounces*, *Penny-weights*, and *Grains*, as in the following Table, *viz.*

Note, That
24 *Grains* make 1 *Penny-weight*,
20 *Penny-weights* 1 *Ounce*, and
12 *Ounces* 1 *Pound Troy*.

Note alſo, That 25 *lb.* is a Quarter of a Hundred by this Weight, 100 *lb.* is one hundred Weight, and 20 hundred one Ton of Gold or Silver.

Examples of Troy-Weight,

6 Ingots of Silv. wt. *viz.*					10	12	20	24	12	20	24
N°	*l.*	*oz.*	*pw.*	*gr.*	*lb.*	*oz.*	*pw.*	*gr.*	*oz.*	*pw.*	*gr.*
1 Wt	4	05	12	10	14	06	10	11	204	10	14
2	5	04	16	17	24	10	11	12	96	07	17
3	3	11	19	20	21	06	07	17	100	11	12
4	4	06	07	12	22	10	12	14	56	16	20
5	5	01	11	12	16	11	12	13	212	10	23
6	4	11	12	13	21	07	06	17	96	19	12
	28	06	00	12—	122	05	01	12—	767	17	02

In the Denomination of *Grains* I ſtop at 24, and find it to amount to 3 *penny-weights* and 12 *Grains* over; wherefore I ſet down 12 *grains*, and carry three *penny-weights* to the *penny-weights*; then I ſay, 3 that I carried and 2 is 5, and 1 is 6, and 7 is 13, and 9 is 22, and 6 is 28, and 2 is 30, and then coming down with the Tens, I ſay, 30 and 10 is 40, and 10 is 50, &c. juſt as I do in *Addition of Money*; (for as there 20*s.* make a Pound, ſo here 20 *penny-weights* make an Ounce) and find it to come juſt to 80; now in 80 there are juſt 4 Twenties, or 4 Ounces; wherefore I ſet down 00, and carry 4 to the *Ounces*, and find them to amount to 42, which makes 3 *Pounds*, and 6 *Ounces* over; wherefore I ſet down 6, and carry 3 to the *Pounds*; ſaying, 3 I carry and 4 is 7, and 5 is 12, &c. and find they come to 28; ſo the Total is 28 *l.* 06 *oz.* 00 *pw.* 12 *gr.* and ſo of the reſt.

How to prove Addition.

IN all *Additions*, whether of ſimple Numbers, that is, Numbers of one Denomination; or in Examples compound, that is, of divers Denominations, as *Pounds*, *Shillings*, *Pence*, and *Farthings*; or *Tons*, *Hundreds*, *Quarters*, and *Pounds*, Great Weight; or *Pounds*, *Ounces*, and *Drams*, Small Weight; *Pounds*, *Ounces*, *Penny-weights*, and *Grains*, Troy-Weight; I ſay, in many of the Examples above-mentioned, the trueſt and beſt Method of Proof, is to caſt the ſame downwards (beginning at the Top) as you did the ſame upwards, beginning at the Bottom) and if it proves the ſame Total, the Work is infallibly right, and beyond any Contradiction; and is much better and more feaſible than the common Method uſed in Schools, of making two Totals, by omitting the upper Line in the Second, which is altogether impracticable in real Buſineſs. I might here alſo give the ſeveral Examples of other *Additions*, ſuch as *Apothecaries Weight*, *Cloth*, *Liquid*, *Dry*, and *Long-Meaſures*, *Time*, &c. but the Method ſerves for any of them, having reſpect to the ſeveral Tables of Quantity belonging to thoſe ſeveral Denominations of Addition above-mentioned, which are as follow, *viz.*

A Table of the Parts of Apothecaries Weight.

	Marks.
20 *Grains* 1 *Scruple.*	℈ a Scruple.
3 *Scruples* 1 *Dram.*	ʒ a Dram.
8 *Drams* 1 *Ounce.*	℥ an Ounce.
12 *Ounces* 1 *Pound.*	℔ Pound.

By theſe Weights they compound their Medicines; but they buy and ſell their Drugs by *Avoirdupois-Weight.*

Cloth-Meaſure.

4 *Nails*, or 9 *Inches*,	1 *qr. of a Yard.*
4 *qrs.* or 36 *Inches*,	1 *Yard.*
5 *qrs.* or 45 *Inches*,	1 *Ell Engliſh.*
3 *qrs.* or 27 *Inches*,	1 *Ell Flemiſh.*
6 *qrs.* or 54 *Inches*,	1 *French Ell.*

A Table of Wool-weight.

Note, That 7 *lb.* make 1 *Clove*; 2 *Cloves*, or 14 *lb.* 1 *Stone*; 2 *Stones*, or 28 *lb.* 1 *Todd*; 6 *Todd* and ½ 1 *Wey*, or 182 *lb.* 2 *Weys* or 364 *lb.* 1 *Sack*; *and* 12 *Sacks* 1 *Laſt*, or 4368 *lb.* 240 *lb.* 1 *Pack of Wool.*

Note, That 1 *lb.* 2 *oz.* 12 *pw. Troy*, is equal to a Pound *Avoirdupois*. And a Pound *Troy* is about 13 *oz.* 2 *Drams* and a half *Avoirdupois*.

		l.	*s.*	*d.*
A Pound Weight *Troy*	of Silver is worth	3	02	2
A Pound Wt. *Avoirdupois*		3	15	3½

100 *l.*	in Gold	weighs	1	11¾	*Avoirdup. Wt.*
	in Silver		26	04	

A Pound *Avoirdupois* is heavier than a Pound *Troy*: But an Ounce *Troy* is heavier than an Ounce *Avoirdupois*.

A Table of Liquid Meaſure.

Liquid Meaſure is of two Sorts, viz. one for *Wine*, *Brandy*, &c. and the other for *Beer* and *Ale*.

Wine, &c.

8 Pints 1 Gallon
42 Gallons 1 Tierce
63 Gallons 1 Hogſhead
84 Gallons 1 Puncheon
2 Hogſheads 1 Pipe or Butt
2 Pipes or Butts 1 Tun, or 252 Gallons

Note, That *ſweet Oil* hath 236 Gallons to the Tun: Butt Oil from *Greenland* hath 252 Gallons to the Tun

Note, The Wine Gallon contains 231 Cubic or Solid Inches, by which all Liquids are meaſured, except Beer and Ale.

Beer Meaſure,

8 Pints 1 Gallon
9 Gallons 1 Firkin
2 Firkins 1 Kilderkin
2 Kilderkins 1 Barrel, or 36 Gallons
1 Barrel and half, 54 Gallons, 1 Hogſhead.

Ale Meaſure.

8 Pints 1 Gallon
8 Gallons 1 Firkin of Ale, Soap, or Herrings
2 Firkins 1 Kilderkin
2 Kilderkins 1 Barrel, or 32 Gallons
1 Barrel and half, or 48 Gallons 1 Hogſhead.

Note, The *Beer* and *Ale* Gallon are the ſame, *viz.* 282 ſolid Inches; but with this Difference, *i. e.* the Barrel of Beer contains 1228 Cubic Inches, or 4 Gallons more than the Barrel of Ale

In a Tun of Wine are
2 Pipes or Butts
6 Tierces
252 Gallons
504 Pottles
1008 Quarts
2016 Pints

In a Pipe or Butt are
2 Hogſheads
3 Tierces
126 Gallons
252 Pottles
504 Quarts
1008 Pints

In a Puncheon are
84 Gallons
168 Pottles
336 Quarts
672 Pints

In a Hogſhead are
63 Gallons
126 Pottles
252 Quarts
504 Pints

In a Barrel of Beer are
2 Kilderkins
4 Firkins
36 Gallons

72 Pottles
144 Quarts
288 Pints

In a Barrel of Ale are

2 Kilderkins
4 Firkins
32 Gallons
64 Pottles
128 Quarts
256 Pints

Dry Meaſure.

2 Pints 1 Quart
2 Quarts 1 Pottle
2 Pottles 1 Gallon
2 Gallons 1 Peck
4 Pecks 1 Buſhel Land Meaſure
5 Pecks 1 Buſhel Water Meaſure
4 Buſhels 1 Comb, or half Quarter
2 Combs 1 Quarter
4 Quarters 1 Chaldron
5 Quarters 1 Wey
2 Weys 1 Laſt, or 10 Quarters
4 Fatts or Vatts, or 56 Buſhels, of Sea-Coal, 1 Chaldron; and 21 Chaldron is accounted a Score in the River *Thames*; Salt and Sea-Coal are heaped, or elſe there are 5 Pecks to the Buſhel

In the Laſt are

2 Weys
10 Quarters
80 Buſhels
320 Pecks
1280 Pottles
2560 Quarts
5120 Pints

In a Wey are

5 Quarters
40 Buſhels
160 Pecks
320 Gallons
640 Pottles
1280 Quarts
2560 Pints

Note, By an Act *Anno* 1712, the Buſhel is 2178 Cubic Inches; and a Gallon of this Meaſure is 272¼ Cubic Inches.

Long Meaſure.

3 Barley Corns 1 Inch
12 Inches 1 Foot
3 Feet 1 Yard
3 Feet 9 Inches 1 Ell Engl.
5 Feet a Geometrical Pace
5 Yards and half, 1 Pole, Perch, or Rod
6 Feet 1 Fathom or 2 Yards
40 Poles, or 220 Yards, 1 Furlong
8 Furlongs 1 Mile, or 1760 Yards
3 Miles 1 League
20 Leagues, or 60 Miles, 1 Degree; and 360 Degrees the ſuppoſed Circumference of the Earth and Sea.

In Miles are

8 Furlongs
320 Poles
1760 Yards
5280 Feet
63360 Inches
190080 Barley Corns.

Land-Meaſure.

5 Yards and half, 1 Pole, Perch, or Rod.
40 Poles make 1 Furlong, or quarter of an Acre.
160 Poles in Length, and 1 in Breadth, is one Acre.
80 Poles in Length, and 2 in Breadth, 1 Acre; and
40 Poles in Length, and 4 in Breadth, 1 Acre.
4 Poles in Length make 1 Chain.
10 Chains in Length, and 1 in Breadth, make 1 Acre.

Time.

60 Seconds 1 Minute
60 Minutes 1 Hour
24 Hours 1 Day natural
7 Days 1 Week
4 Weeks 1 Month
13 Months, 1 Day, and 6 Hours, 1 Solar Year.

In a Year are,
31557600 Seconds
525960 Minutes
8766 Hours
365 Days 6 Hours.

Note, The Year is alſo divided into 12 Calendar Months, which contain 365 Days, according to this good old Verſe, *viz.*
Thirty Days hath September, April, June, *and* November;
February *hath* 28 *alone, and all the reſt thirty and one.*

SUBTRACTION.

THE next Rule in *Arithmetick* is *Subtraction* (or commonly called *Subſtraction)* and this Rule teaches to take a leſſer Number, or Sum, out of a greater, and ſheweth the Remainder, Reſt, Exceſs, or Difference.

Note always to place the leſſer Number under the greater (with the ſame Care and Order as in *Addition)* ſo that Units may ſtand under Units, Tens under Tens, *&c.* and the Remainder under the Line is the Difference ſought: And ſuch Difference being added again to the leſſer Number, ſhall make the greater Number, and is a certain Proof of the ſaid Rule.

A General Rule.

Whatever you uſed to ſtop at in *Addition* (whether of one Denomination or of ſeveral) the ſame you muſt borrow in *Subtraction*, when Need requires: Remembring to pay, or carry 1 to the next Place towards the Left-hand. *Example*; Suppoſe Mr. *Andrews* owes to Mr. *Baker* 323 *l.* whereof Mr. *A.* hath paid to Mr. *B.* the Sum of 146 *l* in part; what remains due to Mr. *Baker?*

Anſwer 177 *l.*

Here the leſſer Number 146, ſtands under the greater 323; and to find the Remainder, or Sum reſting due, I ſay 6 from 3 I cannot; but 6 from 13 (for you muſt always borrow 10 of the next Figure in the ſame under Line, and put it to the Figure or Cypher that ſtands directly over the Figure you ſubſtract) and there remains 7; then 1 that I borrow and 4 is 5, for as I borrowed 10 (or 1) out of 4, ſo I muſt pay the ſaid 1 or 10 (for ſo it really is, becauſe of the Decuple Proportion of Increaſe from the Right hand to the Left) to the ſaid Figure 4 again, as above hinted: I ſay 5 from 2 I cannot; but 5 from 12 (borrowing 10 and putting it to the over Figure 2, as above directed) and there remains 7; then 1 that I borrowed and 1 is 2, from 3 the over Figure, and there reſts 1, and ſo the Example is done; and by it is ſhewn that *A.* ſtill owes *B.* 177 Pounds, as appears in the Work; and for Proof of its Verity, add 177 the Remainder, to 146 the leſſer of the two given Numbers, and it will make 323, being the ſame with the greater Number, or Sum of Money firſt due; and therefore, a ſure Proof of the Truth and Certainty of the Rule. And as *Subtraction* is proved by *Addition*, ſo may *Addition* be proved by *Subtraction*: For if the two aforeſaid Numbers, *viz.* 323 and 146, are added, their Total is 469; from which if you deduct 146, the Remainder will be the greater Number; or if you ſubſtract 323 from the ſaid 469, the Remainder will be 146 the leſſer Number.

All Examples or Sums in *Subſtraction* of one Denomination are performed as above, they varying not at all: But however, once more, for the better Explanation. Admit, a great Sheep-maſter hath in all 6904 Sheep, and takes out of them 2490 to diſpoſe of at Market; how many doth he leave behind? To know this ſet them down thus:

From—6904 the Greater Number
Take—2490 the Leſſer Number.

Anſwer 4414 the Remainder.

Here I ſay 0 from 4, and there remains 4; then 9 from nothing (or 0) I cannot; but 9 from 10 (putting or making the 0 10) and there remains 1; then 1 that I borrow and 4 make 5; and 5 from 9, and there reſt 4; and laſtly, 2 from 6, and there remains alſo 4 (for I borrowed none, and therefore there's no Occaſion of paying) ſo that he leaves behind him juſt 4414; which put to the Number he takes to Market, makes the Number he firſt had, *viz.* 6904, and ſhews the Deduction to be true, and the Anſwer right.

More Examples for Practice.

	l.	*Yards.*	*Gallons.*	*Pounds.*
From	4796	3700	47200	479672
Take	2929	1976	31976	97694
Rem.	1867	1724	15224	381978
Proof	4796	3700	47200	479672

Any Diſtance of Time that is from any particular Date of a Year, may be known by ſubtracting that Date from the preſent Date of the Year.

Example.

I.—1750
1666 the Fire of *London.*
Since 84

II.—1750
1588 the *Spaniſh* Invaſion.
Since 162

III.—1750
1605 Gun-Powder Treaſon.
Since 145

Subtraction of divers Denominations.

Of Money.

	l.	*s.*	*d.*
Due	9	02	6
Paid	6	16	4
Reſts due	2	06	2

Suppoſe Mr. *Campion* owes Mr. *Darnell* 9 *l.* 2 *s.* 6 *d.* and Mr. *C.* hath paid Mr. *D.* in part 6 *l.* 16 *s.* 4 *d.* what remains due to Mr. *Darnell?* Anſwer, Due to Mr. *Darnell* 2 *l.* 6 *s.* 2 *d.* as by this Example.

	10	20	124
	l.	*s.*	*d.*
Sold for	242	16	3¾
Paid in part	174	12	6½
Anſwer	68	03	9¼

Again, Mr. *Edwards* ſells to Mr. *Francis*, *Spaniſh* Wool to the Value of 242 *l.* 16 *s.* 3 *d.* ¾, and pays preſent Money, and by a Note on Mr. *Goodwin*, the Sum of 174 *l.* 12 *s.* 6 *d.* ½; what Money remains unpaid from Mr. *Francis?* Anſwer 68 *l.* 3 *s.* 9 *d.* ¼.

In the firſt of theſe Examples I ſay, 4 *d.* from 6 *d.* and there remains 2 *d.* then 16 *s.* from 2 *s.* I cannot, but borrowing one Integer of the next denomination, or 1 Pound, which is 20 *s.* I ſay 16 from 20, and there reſts 4, and taking the over Number 2, and putting it to the Remainder 4, makes 6; wherefore I put down 6 in the Place of Shillings, and ſay, 1 that I borrow and 6 is 7; now 7 *l.* from 9 *l.* there remains 2 *l.* ſo the Money reſting due to Mr. *Darnell* is 2 *l.* 6 *s.* 2 *d.* as in the Example.

In the ſecond Example I ſay, 2 Farthings (or a Half-penny) from 3 Farthings, and there remains 1 or ¼, which I ſet down in its proper Place, *viz.* under the Denomination of Farthings; then 6 from 3 I cannot, but 6 from 12, (as marked over the Denomination) and there remains 6, and 3 *d.* over it makes 9 *d.* which I place under the Line in its right Place, *viz.* of Pence; then 1 that I borrowed (that is 1 Shilling) and 12 is 13; 13 *s.* from 16 *s.* and there reſts 3, which I likewiſe ſet down under its own Rank; then 4 from 2 I cannot, but 4 from 12 (borrowing 10, as in *Addition*, I carry 1 for every 10) and there reſts 8; then 1 that I borrow and 7 makes 8; 8 from 4 I cannot, but 8 from 14, and there remains 6; ſo that the Sum remaining due is 68 *l.* 3 *s.* 9 *d.* ¼, as in the Work. And for its Proof, you muſt add the Remainder, 68 *l.* 3 *s.* 9 *d.* ¼, to the leſſer, or under Sum, 174 *l.* 12 *s.* 6 *d.* ½, and it makes 242 *l.* 16 *s.* 3 *d.* ¾, the Sum firſt due, and is a Proof of the Work's being right. See the Example above.

More Examples for Practice.

	10 20 12 4 *l.* *s.* *d.*	10 20 12 *l.* *s.* *d.*	10 20 12 4 *l.* *s.* *d.*
Due	174—16—6¼	74—10—4	2471—07—0
Paid	97—12—4¾	29—12—9	1976—16—6½
Remain	77—04—1½	44—17—7	494—10—5½
Proof	174—16—6¼	74—10—4	2471—07—0

	10 20 12	10 20 12	10 20 12
1*ſt Due*	74—00—00	274—16—6	796—00—0
Paid	46—12—10	197—19—4	279—11—7
Balance	27—07—02	76—17—2	516—08—5
Proof	74—00—00	274—16—6	796—00—0

Sometimes a Sum owing may be paid at ſeveral Times; then the ſeveral Payments muſt be added together, and their Total deducted from the Sum firſt due, as in this and the Examples following.

Owing—266 *l.*

Paid at Times—
20
15
30
90
17
24
60

Paid in all 256 *deduct.*

Reſts due 10

Proof 266

Mor

	l. s. d.
More due	249—12—0.
Received at ſeveral Times.	24—12—6 9—14—9 20—00—0 16—16—6 22—10—2 13—12—6 7—16—4
Received in all	115—02—9
Reſts due	134—09—3
Proof	249—12—0

	l. s. d.
Receiv'd	100—10—0
Paid to ſeveral Perſons.	6—16—0 10—00—0 5—12—6 20—10—0 7—09—6 9—08—6 7—12—6
Paid in all	67—09—0
Remains in the Bag.	33—01—0

	10	20	4	28
	Tons.	*C.*	*qrs.*	*lb.*
From	44	12	1	10
Take	39	14	2	06
	4	17	3	04
Proof	44	12	1	10

10	4	28
C.	*qrs.*	*lb.*
246	2	12
164	3	22
81	2	18
246	2	12

10	16	16
lb.	*oz.*	*dr.*
146	02	10
97	19	12
48	07	14
146	02	10

Troy Weight.

	10	12	20	24
	lb.	*oz.*	*pwt.*	*gr.*
From	462	04	10	11
Take	196	09	06	16
Remain	265	07	03	19
Proof	462	04	10	11

10	20	24
oz.	*pwt.*	*gr.*
1247	10	12
976	16	17
270	13	19
1247	10	12

And ſo much for *Subtraction*; which Method will ſerve for any Denomination whatever, having Reſpect to the ſeveral Tables of Quantity, as before hinted in *Addition*.

MULTIPLICATION.

THE next Rule in order is *Multiplication*, and perhaps the moſt ſerviceable Rule in Buſineſs, for its quick Diſpatch, of all others in *Arithmetick*; and I ſhall endeavour to ſhew, by its Nature, Quality, and Uſe, that it is ſo. And,

1. *Multiplication* is a Rule that by two Numbers given, teacheth to find out a third, which ſhall contain either of the two as many times as the other containeth Units.

2. In ſome Caſes *Multiplication* is alſo a compendious Working of *Addition*.

3. It ſerves likewiſe to bring great Denominations into ſmall, as Pounds into Shillings, Pence, or Farthings.

4. Having the Length and Breadth of a plain Superficies, we find its Contents in Square Meaſure.

5. By *Multiplication* we find, by having the Value of one Thing, or the Wages of one Perſon, how to know the Value of many Things, or the Wages of many Perſons.

In *Multiplication* we are particularly to take Notice of theſe three Terms, *viz*

The { *Multiplicand*,
Multiplier, and
Product.

1. The *Multiplicand* (generally the greater of the two Numbers) is the Number to be multiplied.

2. The *Multiplier* (generally the leſſer of the two Numbers) is the Number to multiply with.

3. The *Product*, or Reſult of the Work, being the Anſwer.

But before any Procedure can be made in this Rule, it is neceſſary to have the following Table by Heart, and that very perfectly.

The Multiplication Table.

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3		9	12	15	18	21	24	27	30	33	36
4			16	20	24	28	32	36	40	44	48
5				25	30	35	40	45	50	55	60
6					36	42	48	54	60	66	72
7						49	56	63	70	77	84
8							64	72	80	88	96
9								81	90	99	108
10									100	110	120
11										121	132
12											144

This Table is ſo plain and eaſy, that there is no need of Direction; for 'tis but guiding the Eye from the ſide Column to the Head, and in its oppoſite Angle or Square you have the Anſwer; and contrarywiſe by directing the Eye from the Head to the Side, you have the ſame; as 6 times 9 is 54, and 9 times 6 is 54; ſo 7 times 8 is 56, and 8 times 7 is 56, *&c.* And ſo it ought to be got by heart, for the more dextrous Readineſs in muliplying.

Now for Application.

Example 1. How many is 3 times 472? Which muſt be ſet down in the Margin; and then ſay, 3 times 2 is 6, which place under 3 the Multiplier; then 3 times 7 is 21; ſet down 1 under 7, and carry 2 for the two Tens, as in *Addition of one Denomination*; then 3 times 4 is 12, and 2 is 14, which ſet

$$\begin{array}{r} 472 \\ 3 \\ \hline 1416 \\ \hline \end{array}$$

down, and the Product is 1416; that is, 3 times 472 makes ſo much; and may be proved by *Addition*, by ſetting down 472 three times, in Additional Order, and caſting it up, which makes the Aſſertion good in the ſecond Definition, that this Rule compendiouſly performs the Office of Addition. Likewiſe the foregoing Example agrees with the firſt Definition; for as 3 times 472 makes 1416, ſo doth 472 times 3 make the ſame, *viz.* 1416.

Example 2. Again, how many makes 742 multiplied by 4?

742	*Multiplicand*
4	*Multiplier.*
2968	*Product.*

Here I ſay, 4 times 2 is 8, and 4 times 4 is 16; 6, and carry 1; and 4 times 7 is 28, and 1 is 29, which ſet down; ſo the whole Product is 2968, as *per* Example.

More Examples of one Figure in the *Multiplirr*, are theſe, *viz.*

Multiplic.	7420	4444	7460	90704	56789
Multiplier	5	6	7	8	9
Product	37100	26664	52220	725632	511101

Compound Multiplication,

Is when the *Multiplier* conſiſts of two, three, four, or more Figures, or Figures and Cyphers.

And here you muſt begin with that Figure which is in the Place of Units of the *Multiplier*, and go through the whole *Muliplicand*, by multiplying each Figure of it firſt by that ſaid Unit Figure, then by the next, to wit, by the Figure in the Place of Tens of the *Multiplier*, then with the third, *&c.* to the laſt; always remembring to place the firſt Figure of every Product or Line, (for you will ever have as many as you have ſignificant Figures in the *Multiplier*) I ſay, remember to place the firſt Figure of each Line exactly and perpendicularly under the Figure you multiply by; and then add the ſeveral Lines or Products together, which ſo collected give the total Product required, as in the Examples following, *viz.*

Examp

Example 1.

How many is, or are, 23 times 7426? Firſt I begin with the Unit Figure 3 in the *Multiplier*, ſaying 3 times 6, is 18; 8 (which I ſet directly under 3 by which I multiply) and carry 1; then 3 times 2 is 6, and 1 is 7; then 3 times 4 is 12; 2 and carry 1; then 3 times 7 is 21, and 1 is 22: and ſo I have done with the firſt Figure of the *Multiplier*, *viz* 3. Then I go to the next, that is 2, and twice 6 is 12; 2 and carry 1, (which 2 is placed in a direct Line under 2, the multiplying Figure) then twice 2 is 4, and 1 is 5; then twice 4 is 8; and laſtly, twice 7 is 14, which I ſet down: Then I add the two Products together, ſaying, 8 is 8, *&c.* and the Total is the right and proper Product, or Reſult of the Multiplication, *viz.* 170798. Again,

7426
23

22278
14852

170798

Example. 2.

What is the Reſult or total Product of—527527
Multiplied by—285

2637635
4220216
1055054

150345195

It will appear too prolix, and altogether unneceſſary, to give more verbal Directions; nay, indeed nauſeous Tautology, ſince thoſe given above are ſufficient; and therefore the Learner is referred to the Obſervation of the Example, as alſo to thoſe two that follow, *viz.*

527535
15728

4220280
1055070
3692745
2637675
527535

8297070480

275827
19725

1379135
551654
1930789
2482443
275827

5440687575

When Cyphers are intermixed with Figures in the *Multiplier*, then multiply by the Figures as above; and when you come to a Cypher in the *Multiplier*, then ſet down another Cypher exactly and perpendicularly under it, then begin the *Multiplicand* again with the next Figure to the Cypher in the

Multiplier, and go through it in the ſame Line, placing the firſt Figure of that Product next to the Cypher towards the Left-hand, but then heed muſt be taken that the next Figure or Cypher of the next Line muſt be ſet down one Degree farther towards the Left-hand, and not immediately under the laſt Figure ſet down next to the Cypher: As in the following Examples may be fully underſtood.

24393
402
48786
975720
9805986

7864371
23604
31457484
471862260
23593113
15728742
185630613084

327586
6030
9827580
19655160
1975343580

When you have a Cypher or Cyphers in the *Multiplier*, at the Beginning towards the Right-hand, then ſet it, or them, backwards from the Place of Units towards the Right-hand; and when you have multiplied by the Figure or Figures, annex the Cypher or Cyphers: *As in theſe Examples,*

4762
70
333340

47962
400
19184800

4632
2600
27792
9264
12043200

If you have Cyphers both in the *Multiplicand* and *Multiplier*, then neglect the Cyphers in both, and multiply by the Figures, and annex the Cyphers at laſt: *As in theſe Examples.*

42600
220
852
852
9372000

42300
12000
846
423
507600000

376400
2400
15056
7528
903360000

When you are to multiply by 10, 100, 1000, or 10000, 'tis only adding or annexing ſo many Cyphers to the *Multiplicand*, that is either 1, 2, 3, or 4 Cyphers, and the Work is done. *Example.* Suppoſe I am to multiply 375 by the Numbers above; if I multiply it by 10, then I join 0 to 375, and then it makes, or the Product is, 3750: If by 100, then I annex 00, and then it makes 37500: If by 1000, I put to it 000, and then it produces 375000: And laſtly, if by 10000, I then add 0000, and then it makes 3750000, *&c.* And thus may any Number be multiplied, when the *Multiplier* conſiſts of a Unit with any Number of Cyphers, and done by Inſpection only, without any formal ſetting down the *Multiplicand* with a Line drawn under it, *&c.*

Thus far for Direction in the manner how to multiply; the next will be to ſhew the Uſes of *Multiplication* in real Buſineſs, and how to apply it on proper Occaſions, *viz.*

1. Suppoſe you want to know how many half Crowns there are in 246 *l.* you know that 8 half Crowns make 1 *l.* whereſore ſet them down thus:

246 *l.*
Multiply by 8
Anſwer 1968

Again, in 1968 Half Crowns how many Pence?
30 Pence in half a Crown.

59040 Pence the Anſwer.

And this ſerves to make out, that great Denominations are brought into ſmaller by this Rule, according to the third Definition.

2. Admit you wanted to know the Contents of a large Shuffle-board Table, 34 Foot long, and 4 Foot wide, multiply 34 the Length, by 4 the Breadth, and the Anſwer will be 136 ſquare Feet for the true Contents of ſuch a Table. And this agrees with the 4th Definition of this Rule.

3. If I know the Value of a Yard of Broadcloth to be 12 Shillings, what is the Value of 220 Yards of the ſaid Cloth in Shillings?

```
              220
Multiply by    12
             ----
              440
             220
             ----
             2640 Shillings, or 132 Pounds.
             ----
```

If the Wages of 1 Seaman be 23 Shillings a Month, what is the Wages of 250 Seamen for the ſame Time?

```
Multiply by   23
            ----
             750
            500
            ----
Anſwer      5750 Shillings, or 287 l. 10 s.
            ----
```

And theſe two Examples accord with the fifth Definition, or Uſe of this Rule.

And thus much for plain *Multiplication.*

I ſhall, in the next Place, ſay ſome ſmall matter concerning *Multiplication of Money*, and a little of its Uſe, and ſo conclude this Rule.

Multiplication of Money.

Multiplication of Money (what moſt would learn above any thing) hath great Affinity with *Addition of Money*; the ſame Method being taken in carrying from one Denomination to the next, *viz.* from Farthings to Pence, from Pence to Shillings, and from Shillings to Pounds. And as in *Addition* (and other *Multiplications*) you begin at the Right-hand, and proceed towards the Left; ſo here you begin at the leaſt Denomination, which is alſo at the Right-hand.

This Method of accompting is the moſt apt and expeditious of all others, for ſmall Quantities; and therefore extreamly neceſſary in making Bills of Parcels, &c. And is beyond all Contradiction, as ſure and certain as any way whatſoever.

The General Rule,

Is always to multiply the Price by the Quantity.

The firſt Step is, for Quantities from 2 to 12; and this is done by one Multiplier; as in the Examples following.

Example 1. *l. s. d.*

Multiply———————————7—12—6

(or 6 Pieces of Cloth at *l.*7—12—6 *per* Piece) by 6

45—15—0

Here I ſay 6 times 6 is 36 Pence, which is juſt 3 s. I ſet down 0 in the Place of Pence, and carry 3 *s.* to the Place of Shillings, (exactly the ſame as in *Addition of Money*) then 6 times 12 is 72, and 3 is 75 *s.* or 3 *l.* 15 *s.* wherefore I ſet down 15 in the Place of Shillings, and carry 3 to the Pounds; then 6 times 7 is 42, and 3 is 45 *l.* So the whole amount of the 6 Cloths, at 7—12—6 *per* Cloth, is 45 *l.* 15 *s.* as in the work, and very conciſe.

Example 2.

Again, How much is 9 times 13 *s.* 4 *d.* or what is the Amount of 9 Marks?

In this Example I ſay, 9 times 4 is 36 *d.* or 3 s. I ſet down 0, and carry 3; then 9 times 3 is 27, and 3 makes 30; I ſet down 00, and carry 3 (as in Multiplication of ſimple Numbers;) then 9 times 1 is 9, and 3 is 12; which being the Tens of Shillings, conſequently they are Angels; which being halved, make juſt 6 *l.* and ſo much is the Value of 9 Marks, or any thing elſe at that Price, *viz.* 13 s. 4 *d.*

9

6—00—0 *Anſwer.*

Example 3.

Once more; What comes 12 Gallons of Wine to at 5 *s.* 4 *d.* *per* Gallon?

s. d.

5—4

12

l. 3—4—0

Here I ſay, 12 times 4 is 48; 0 and carry 4; then 12 times 5 is 60, and 4 is 64 *s.* or 3 *l.* 4 *s.* &c.

The next Degree or Step of Advance in this Way of Reckoning, is of Quantities exceeding 12, even to 12 times 12, or 144; all which, as far as 144, are found in that excellent Table, the *Table of Multiplication*; which is a ready Help to all Purpoſes of Reckoning, and particularly in this Way: And that you may proceed with Dexterity, you muſt be very ready in the ſaid Table, that you may be immediately apprehenſive what component Parts hit your Quantity propoſed, or pretty near it, (for any Quantity below 12 needs no Recollection at all, as in two of the Examples foregoing) and then work accordingly; as 15 Yards at, *&c.* I readily know that 3 and 5, or 5 and 3, are to be my Multipliers. If to 21, then 3 and 7, or 7 and 3, as above. If to 30, then 5 and 6, or 6 and 5; alſo 3 and 10, or 10 and 3. If to 45, 48, 56, 66, 72, 96, &c. then 5 and 9, 6 and 8, 7 and 8, 6 and 11, 6 and 12, and 8 and 12, &c. are to be Multipliers, and exactly hit their ſeveral Quantities of which they are component Parts; and Examples of this Kind have two Multiplications for their Solution.

When the Quantity propoſed is a Number irregular, or ſuch a Number that no two Numbers in the Table can be found to anſwer it, then we muſt multiply by two ſuch Numbers as come pretty near it, as is ſaid above; and for the Number wanting, to make up the Number or Quantity propoſed, multiply the given Price of one by the Number that is wanting, which will make three Products by three Multiplications; which laſt Product muſt be added to the foregoing Products reſulting from two Multiplications, and the Total will be the Anſwer.

And firſt, I ſhall ſhew Examples of the ſecond Step, *viz.* of Regular Quantities that exceed 12, and are preciſely anſwered at two Multiplications, ſuch as mentioned above, *viz.*

What comes 15 Yards of Muſlin to, at *per* Yard?

Here 3 Times 5 is 15 *d.* or 1 *s.* and 3 *d.* 3 and carry 1 *s.* then 3 times 3 is 9, and 1 is 10 *s.* ſo the firſt Product is 10 *s.* 3 *d.* which I multiply by 5, ſaying 5 times 3 is 15 *d.* or 1 *s.* 3 *d.* 3 and carry 1; then 5 times 10 is 50, and 1 is 51 *s.* or 2 *l.* 11 *s.* So the whole Amount of 15 Yards, at 3 *s.* 5 *d. per* Yard, is 2 *l.* 11 *s* 3 *d.* And demonſtrable thus, *viz.* If 10 *s.* 3 *d.* be the Value of three times 3 *s* 5 *d.* then 5 times the Value of 10 *s.* 3 *d.* muſt of neceſſity be 15 times the Value of 3 *s.* 5 *d.* becauſe 5 times 3 is 15: And its Truth may be proved by *Addition* and *Multiplication*, thus; ſet down 3 *s.* 5 *d.* three times, in Additional Order, and put the three Lines together, and the Total of them multiply by 5, as before, and the Anſwer will be the ſame. Or ſet down 17 *s.* 1 *d.* (the Product

s. *d*
3—5
3 and 5
———
10—3
5
———
2—11—3
———

duct of 3 *s.* 5 *d.* multiplied by 5) three times alſo, and add them together, and the Total will be exactly the ſame with the Reſult by Multiplication; as in the following Specimen of Work.

(1)	(2)	
s. *d.*	*s.* *d.*	*s.* *d.*
3—5	3—5	17—1
3—5	5	17—1
3—5	17—1	17—1
10—3		2—11—3
5		
2—11—3		

Here the firſt of theſe two Proofs is worked by *Addition* and *Multiplication*, and the ſecond by *Multiplication* (as *per* Margin) and *Addition*. Alſo,

By this we ſee, that in all Examples under this Head, we are to pitch on two Numbers (for *Multipliers*) in the Table, which multiplied together, make the Quantity propoſed; and then we are to multiply the Price by one of the Numbers (it matters not by which firſt) and then that Product is to be multiplied by the other Number, and the ſecond or laſt Product will be the Anſwer.

Example 2.

Again, what is the Value of 21 Gallons of Brandy?

s. *d.*
at 7—9 *per Gallon.*
7 and 3
2—14—3
3
8—02—9

In this Example I ſay, 7 times 9 is 63 *d.* or 5 *s.* 3 *d.* I ſet down 3 and carry 5; then 7 times 7 is 49, and 5 is 54 *s.* or 2 *l.* 14 *s.* So the firſt Product is 2 *l.* 14 *s.* 3 *d.* which I multiply by 3, and that produces the laſt Product or Anſwer, *viz.* 8 *l.* 2 *s.* 9 *d.*

Now follow a few more Examples of this Sort, without any verbal Directions, becauſe I think thoſe already given to be ſufficient.

Example 3.

What comes 30 Ells of
Holland to, *s.* *d.*
at 3—7 *per Ell*
10 and 3

1—15—10
3

Anſwer 5—07—06

Example 4.

45 Pound of Raw Silk
at 15—6 *per lb.*
5 and 9

3—17—6
9

Anſwer 34—17—6

In the firſt Product of this Example I ſay, the half of 7 is 3 and half, or 3 *l.* 10 *s.* And in the laſt, the half of 15 is 7 and half, or 7 *l.* 10 *s.* &*c.*

Example 5.

56 Buſhels of Wheat,
s. *d.*
at 4—9
7 and 8

1—13—3
8

Anſwer 13—06—0

Example 6.

s. *d.*
72 Broad Pcs. at 23—6 *each.*
12 and 6

14—02—0
6

84—12—0

In the firſt Product the half of 28 Angels is 14 *l.* &*c.*

Example 7.

108 *lb.* of Indigo Lahore,
at 7 *s.* 8 *d.*
9 and 12

3—9—0
12

Anſwer 41—8—0

Example 8. *l.* *s.* *d.*
96 C. of Currants, at ——— 2—13—6 *per* C.
8 and 12

21—08—0
12

Anſwer 256—16—0

The next Gradation of Advance is of Quantities irregular, or of Numbers that are not to be anſwered preciſely at two *Multiplications:* In this Caſe, there ariſeth no Increaſe of Difficulty, but it is as eaſy as the Examples foregoing; only here you will have an Addition of one Line more, occaſioned by bringing down the Price of one to be added to the laſt Product; or elſe a Line more made by multiplying the Price by what is defective or wanting in the Number by two Multiplications, to make up the propoſed Quantity compleat; as it may be of 2, 3 4, 5, &c. as by the ſubſequent Examples may be ſeen and underſtood.

Example 1. What is the Product of 2 *l.* 13 *s.* 6 *d.* multiplied by 39?

l. 2—13—6
6 and 6
16—01—0
6
96—06—0
8—00—6
104—06—0

Here I find that 6 multiplied by 6, makes 36; which is within 3 of the Quantity propoſed; wherefore I multiply by 6, and that Product again by the other 6; the laſt Product is 96 *l.* 6 *s.* which is the Value of 36; but we want to know the Value of 39; wherefore I multiply the Price of one, *viz.* 2 *l.* 13 *s.* 6 *d.* by 3 that is defective or wanting to make up 36 to 39, ſaying, 3 times 6 is 18 *d.* &c. And find that 3 times 2 *l.* 13 *s.* 6 *d.* is 8 *l.* 00 *s.* 6 *d.* which added to 96 *l.* 6 *s.* 0 *d.* the Total gives the compleat Value of 39; for 36 and 3 makes 39. See the Work.

Example 2. What comes 79 C. wt. of Cheeſe to, at 28 *s.* *per.* C. weight?

l. *s.* *d.*
28—0
7 and 11
9—16—0
11
107—16—0
2—16—0
110—12—0 *Anſwer*

In this Example I ſay 7 times 0 is 0; then 7 times 8 is 56; 6 and carry 5; and 7 times 2 is 14, and 5 is 19; the half of which is 9 and half, or 9 *l.* 10 *s.* 0 *d.* So the firſt Product is 9 *l.* 16 *s.* 0 *d.* which multiplied by 11, produces 107 *l.* 16 *s.* 0 *d.* or the Value of 77; then for 2 wanting I multiply the Price by it, and that gives 2 *l.* 16 *s.* 0 *d.* which added to 107 *l.* 16 *s.* 0 *d.* makes the whole Value of 79, *viz.* 110 *l.* 12 *s.* 0 *d.* as in the Work. Or, as there are no Pence in the Price, you may multiply 28 *s.* by 79 without bringing it into Pounds as you work it, but omit it till the laſt, and then cut off or ſeparate the laſt Figure or Cypher of the Product towards the Right-hand, and halve thoſe towards the Left, which half will be Pounds, and the Figure cut off Shillings, as in this Example.

s.
28
79

252
196

221,2

l. 110,12

The half of 2 is 1, the half of 2 is 1, and the half of 1 is 0, which 1 joined to the 2 ſevered from 221, makes 12; ſo the Anſwer is 110 *l.* 12 *s.* as before.

Example 3. 112 Pound of Sugar at 5 *d.* ½ *per lb.* ſet down thus:

s. *d.*
5 ½ *per* Pound.
10 and 10

4—07
10

2—05—10
05—06 the Product of 5 *d.* ½ by 12 defective.

2—11—04 the Anſwer.

Here after I have multiplied by 10 and 10, the Parts of 100, there wants 12; wherefore I multiplied 5 *d.* ½ by 12, and it gives 5 *s.* 6 *d.* for 12 *lb.* at 5 *d.* ½, which added to 2 *l.* 5 *s.* 10 *d.* the Value of 100, makes 2 *l.* 11 *s.* 4 *d.* the true Value of 112 *lb.* at 5 *d.* ½ *per* Pound.

Example 4. 94 Stone of Beef, at 22 *d.* or 1 *s.* 10 *d. per* Stone.

1 *s.* 10 *d.*
10 and 9
18—04
9
8—05—00
07—04
8—12—04 Anſwer.

Here what is wanting, after the two Multiplications, is 4; wherefore I multiply 1 *s.* 10 *d.* (the Price) by 4, which produces 7 *s.* 4 *d.* to be added, *&c.*

Example 5. 97 C ½ of Raiſins,

s. *d.*
at 25—06 *per* C.
9 and 10
11—09—06
10
114—15—00
8—18—06
0—12—09 for the ½ C.
124—06—03

After I have multiplied by 9 and 10, I multiply the Price 25 *s.* 6 *d.* by the Quantity wanting, and it produces 8 *l.* 18 *s.* 6 *d.* then for the half C. I take half of the Price, which is 12 *s.* 9 *d.* and then collect the three Lines, the Total of which is 124 *l.* 6 *s.* 3 *d.* for the Anſwer.

Note, From the laſt Example may be obſerved, that there is no need of too much Solicitude concerning coming ſo very near by two Multiplications, for there 7 is wanting to make up the true Quantity; nay, if the two Multiplications be ſhort by 20 or 12, it is near enough; for 'tis as eaſy to multiply the Price by 10 or 12, as by 2 or 3, and the Addition is the ſame.

Example 6. Once more; What comes 120 C ¾ of Hops to, at 4 *l.* 10 *s.* 6 *d. per* C?

l. *s.* *d.*
4—10—06
10 and 10
45—05—00
10
452—10—00
45—05—00
2—05—03
1—02—07½
501—02—10½ Anſw.

After having multiplied by 10 and 10 which makes 100, I multiply the Price, 4 *l.* 10 *s.* 6 *d.* by 10 that is wanting, which gives the ſame with the firſt Product, *viz.* 45 *l.* 5 *s.* 0 *d.* which ſtands under the Product by 100; and for the ¾ of a C. I take ¾ of the Price, *viz.* firſt the half, and then the half of that half, that is 2 *l.* 5 *s* 3 *d.* and 1 *l.* 2 *s.* 7 *d.* ½; which four Lines added together, make 501 *l.* 2 *s.* 10½ for the Anſwer.

To prove Multiplication.

Whether of Simple Numbers, or of Money; it is moſt ſurely done by *Diviſion*; but before that is known, take this Method, *viz.* As you multiplied the *Multiplicand* by the *Multiplier*, ſo contrarywiſe multiply the *Multiplier* by the *Multiplicand*; and if the Products are alike, the Work is right; or otherwiſe one of them is wrong, and muſt be gone over again till they do agree.

Example 1.

365 Days in a Year.
24 Hours in a Day.
1460
730
8760

Here (reverſely) I ſay, 5 times 4 is 20; 0 and carry 2; 6 times 4 is 24, and 2 is 26; 6 and carry 2; and 3 times 4 is 12, and 2 is 14. Then 5 times 2 is 10; 0 and carry 1; 6 times 2 is 12, and 1 is 13; 3 and carry 1; and 3 times 2 is 6, and 1 is 7. Which Products, added together, make 8760, the Hours in a Year, without taking in the odd 6 Hours, which the Year doth conſiſt of more than 365 Days.

Example 2.

56 Gallons of Spirits at
s *d*.
3—2 *per* Gallon.
7 and 8

1—02—2
8

8—17—4 Anſwer.

I ſay here, twice 7 is 14; 2 and carry 1 *s*. and 3 times 7 is 21, and 1 is 22 *s* or 1 *l*. 2 *s*. Again, twice 8 is 16 *d*. 4 and carry 1 *s*. and twice 8 is 16, and 1 is 17 *s*. 17 and carry 0; and once 8 is 8 *l*. Thus both theſe Examples are the ſame in conſequence as if you proceeded in the common and regular Method of *Multiplication*, and ſhews the Truth of Operation.

The next Rule in order, of courſe, is

DIVISION.

THIS Rule, though accounted the hardeſt Leſſon in *Arithmetick*, yet I ſhall make it eaſy and intelligible to the meaneſt Capacity.

The Uſe of this Rule is to know how many times one Number or Sum is contained in another; as if it were aſked, how often is 9 contained in 54? the Anſwer is 6 times; or, how many times 12 is there in 144? Anſwer, 12 times.

As by *Multiplication* great Names or Denominations are brought into ſmall; ſo contrarily, by *Diviſion*, ſmall Names are brought into greater; as Farthings (from one Gradation to another) into Pounds, Pounds Weight into Tons Weight, and Gallons Liquid into Tuns Liquid, *&c.*

In this Rule we are to take particular Notice of theſe three certain Terms following, *viz.*

1. The *Dividend*, or Number to be divided.
2. The *Diviſor*, or Number by which we divide.
3. The *Quotient*, or Anſwer to the Work; which ſhews how often the Diviſor is contained in the Dividend.

4. The *Remainder*; which is an uncertain Branch of this Rule, becauſe there is ſometimes a Remainder, and ſometimes not. ☞ And you muſt particularly note, That the *Remainder* is ever of the ſame Name with the *Dividend*, and is always leſs than the *Diviſor*; for if it be more, or equal to the *Diviſor*, the Work is wrong.

Diviſion is either Single or Compound; *Single*, when the *Diviſor* conſiſteth of a ſingle Figure, and the *Dividend* of two at moſt : Any of this ſort is anſwered by the *Multiplication Table* ; as if 63 were to be divided by 7, the Anſwer will be 9 times. Here 63 is the *Dividend*, 7 the *Diviſor*, and 9 the *Quotient* or *Anſwer*.

Compound Diviſion is when the *Dividend* hath many, or more Figures or Cyphers than two, and the *Diviſor* one or more Figures or Cyphers, *&c.*

Example.

How many times 7 is there contained in 365 ? Or, how many Weeks in a Year ?

```
7) 365 (52
   35
   ---
    15
    14
   ---
    (1)
```

A General Rule for Working.

Note { 1. Seek,
2. Multiply,
3. Subſtract.

Having ſet down the Example with two crooked Lines, or half Parentheſis, one for the Diviſor, and the other for the Quotient, I begin according to the afore-mentioned general Rule for Working, by ſeeking or aſking how often I can take 7 the *Diviſor*, out of 36 the two firſt Figures of the *Dividend* (for I cannot take 7 out of 3, the *Quotient* being never to begin with 0) and the *Anſwer* is 5 times; wherefore I place 5 in the *Quotient*, and multiply the *Diviſor* 7 by it (as directed in the *General Rule*) ſaying 5 times 7 is 35, which I place under 36 ; and then thirdly according to the ſaid Rule, I ſubſtract 35 from 36, and there remains 1 ; to which I bring down the next, or laſt Figure of the *Dividend*, *viz.* 5, and then there is 15 for a new *Dividend*, or *Dividual* to work upon ; then I aſk or ſeek again, how oft 7 may be taken in 15 ? and the Anſwer is 2 times ; wherefore I put 2 in the *Quotient* next to the 5 ; by which 2 I alſo multiply the *Diviſor* 7, ſaying, twice 7 is 14 ; which I ſet down under 15, and ſubſtract, and there remains 1, which I place between two Semicircles thus, (1) as it ſtands in the Work ; where obſerve, That 365 is the *Dividend*, 7 the *Diviſor*, 52 the *Quotient*, or *Anſwer*, and 1 the *Remainder* : The *Quotient* declares that 7 is contained in 365, 52 times, and 1 over, or remaining ; which I ſet over the *Diviſor*, thus $\frac{1}{7}$, and ſignifies that there is one ſeventh of a Week, or 1 Day, more than juſt 52 Weeks in a Year, or 365 Days ; which is eaſily to be found by collecting the Days of each Calendar-Month as they ſtand in the Almanack.

You may note, That the ſaid $\frac{1}{7}$ one ſeventh is properly what is called a *Fraction*, or a Piece of Segment of the *Dividend*; but of this hereafter.

Note alſo, That if there had been more Figures or Cyphers in the *Dividend*, they muſt have all been brought down, one by one at a time (and never but one at a time) and (after *Subtraction*) ſet to the *Remainder*; and if there remains 0, you muſt ſtill bring down but one Figure or Cypher at a time; and for every Figure or 0 ſo brought down, there muſt be a Figure or 0 placed in the *Quotient*, according to the times you can take the *Diviſor* out of the ſeveral *Dividuals* you make, by drawing down a Figure or Cypher at a Time out of the *Dividend*, till all be brought down, and the Work ended.

For a Specimen, let us divide 8060 Pounds of Tobacco equally among 8 Men.

8) 8060 (1007 *Quotient*.
8 · ·
——
60
56
——
(4)

Here I ſay the Eights in 8 once: which I put in the Quotient, then the Eights in 0, 0 times; which I likewiſe put in the Quotient; then the Eights in 6, 0 times again; which is alſo placed in the Quotient, and there remains 6; to which I bring down 0, the laſt of the Dividend, and it makes 60; laſtly, the Eights in 60 7 times, and 7 times 8 is 56 from 60, and there remains 4; ſo the Quotient ſhews that each Perſon muſt have 1007 Pounds of Tobacco for his Share in the Dividend 8060 and there remains 4 Pounds over and above, which makes half a Pound more due to each Man, becauſe 4 the Remainder is half of 8 the Diviſor; and ſo the Work is done, the Quotient giving to each Man 1007 Pounds and half for his equal Share.

Note, That in the Operation, every time that you bring down a Figure or Cypher, you are to make a Point under it in the Dividend, to ſignify that ſuch a Figure or Cypher hath been brought down and done with, as may be obſerved in the foregoing Example.

Though this Way of Working is plain, and eaſy to be underſtood, yet it is ſomewhat tedious; and therefore I ſhew a quicker Way for Diſpatch, when the Diviſor is a ſingle Figure; as ſhall be made conſpicuous in theſe Examples following, *viz.*

	I.	II.	III.
	4)78906	5)34567	6)29702
Quotient	19726 (2)	6913 (2)	4950 (2)
	4	5	6
Proof	78906	34567	29702

In the firſt of theſe Examples I ſay, the 4's in 7 once, and there remains 3; which makes 8, the next Figure in the Dividend 38; then the 4's in 38, 9 times; 9 times 4 is 36, from 38, and there remains 2; which makes 9, the next Figure in the Dividend, 29; then the 4's in 29, 7 times; 7 times 4 is 28 from 29, and there reſts 1; which makes 0, the next of the Dividend, 10, and the 4's in 10 twice; twice 4 is 8 from 10, and there remains 2; which makes 6, the laſt of the Dividend, 26; laſtly, the 4's in 26, 6 times; and 6 times 4 is 24, from 26, and there reſts 2 the Remainder: And ſo for the other two Examples. And for Proof of the Work, (or of any other Example) multiply the Quotient by the Diviſor, and take in the Remainder in the firſt place, or Place of Units; and if the Product be the ſame with the Dividend, the Diviſion is right; For I ſay, 4 times 6 is 24, and 2 the Remainder makes 26; 6 and go 2, *&c.*

More Examples by a ſingle Figure.

	3) 54321	7) 279060	9) 234567
Quotient	18107 (0)	39865 (5)	26063 (0)
Proof	54321	279060	234567

This is the ſhorteſt Way of Diviſion that can be by a ſingle Figure.

As it is as neceſſary for Expedition to multiply by 11 and 12, as by a ſingle Figure, to have the Product in one Line; ſo divide as in theſe Examples, *viz.*

11)

	11) 72646206	12) 76677240
Quotient	6604200 (6)	6389770
	11	12
Proof	72646206	76677240
	11) 47627000	12) 42007400
Quotient	4329727 (3)	3500616 (8)
	11	12
Proof	47627000	42007400

In the firſt of theſe Examples, I ſay, the 11's in 72, anſwer 6 times, *&c.* In the ſecond, I ſay, the 12's in 76, anſwer 6 times, *&c.* In the third, the 11's in 47, 4 times; 4 times 11 is 44, from 47, and there reſts 3, *&c.* In the fourth, I ſay, the 12's in 42, 3 times; 3 times 12 is 36, from 42, and there remains 6, *&c.*

By being ready and dextrous in the Examples above, you may expeditiouſly divide by theſe Numbers, *viz* 110, 120, 1100, or 1200, *&c.* for tis but cutting off, or ſeparating the Cyphers from 11 and 12, (when theſe Numbers happen to be Diviſors) and cutting off and ſeparating the like Numbers of Figures or Cyphers from the Right-hand of the Dividend, and then divide the other Figures or Cyphers towards the Left-hand, by 11 or 12, as it ſhall happen; as in the Examples following, *viz.*

Divide 34567 by 110, and 890123 by 120, and 98765 by 1100, and 678901 by 1200.

	11,0) 3456|7	12|0) 89012|3
Quotient	$314\frac{2}{11}$ or $\frac{27}{110}$	$7417\frac{8}{12}$ or $\frac{83}{120}$
	11,00) 987,65	12|00) 6789|01
Quotient	$89\frac{8}{11}$ or $\frac{865}{1100}$	$565\frac{9}{12}$ or $\frac{901}{1200}$

When you divide by 10, 100, 1000, or 10000, *&c.* you have nothing more to do than to cut off, or to ſeparate ſo many Figures or Cyphers of the Dividend towards the Right-hand, as you have Cyphers in the Diviſor, and thoſe

Figures towards the Left make your Quotient; and thoſe cut off towards the Right, is the Remainder.

Examples.

Divide 123456789 by 10, 100, 1000, or 10000.
By 10 the Quotient is 12345678, and the Remainder 9.
By 100 the Quotient is 1234567, and Remainder 89.
By 1000 the Quotient is 123456, and Remainder 789.
By 10000 the Quotient is 12345, and Remainder 6789.

When the Diviſor conſiſteth of ſeveral Figures, then there ariſeth a little more Difficulty in the Work; but if the following Directions are heedfully attended to, the ſeeming Difficulty is eaſily overcome; as in the ſucceeding Example, *viz.*

Suppoſe I am to divide 78901 Pounds among 32 Pariſhes; or ſuppoſe an Aſſeſſment of ſo much Money was laid on ſo many Pariſhes; what muſt each Pariſh pay by an equal Proportion towards the raiſing ſuch a Supply?

Diviſor 32) 78901 (. . . . Quotient.

The Example thus ſet out, I begin at the Left-hand, ſeeking how often I can take 32 out of 78; or more eaſy, how many times 3 there is in 7, and the anſwer is two times; which I place in the Quotient thus, 32) 78901 (2, and then according to the *General Rule of Working*, I multiply the Diviſor 32, by the two placed in the Quotient, ſaying, twice 2 is 4, and twice 3 is 6; ſo there is 64 to be taken out of 78, and ſtands thus:

```
32) 78901 (2
    64
    ——
    14
```

Then I make a Point under 9, the third Figure of the Dividend, and bring it down to the Remainder 14, and then the Work appears thus:

```
32) 78901 (2
    64 ·
    ——
    149
```

Then I ſeek again, aſking how many times 32 in 149; which is not readily to be anſwer'd; but how many times 3, the firſt Figure of the Diviſor, is there in 14, the two firſt Figures of the Dividual 149, and the Anſwer is 4 times; wherefore, after placing 4 in the Quotient, I multiply, (as directed in the *General Rule)* the Diviſor 32 by the ſaid 4, ſaying, 4 times 2 is 8, placing it under 9 in the Dividual; then 4 times 3 is 12, and ſet down under 14; ſo there is 128 to be taken out of 149, and then the Work appears thus:

32) 78901 (24
64··
149
128
210

And after Subtraction there remains 21; then I make a Point under 0 in the Dividend, and bring it down to the Right of the Remainder 21, and then there is 210 for a New Dividual; then, as the General Rule directs, I ſeek again, ſaying, how many times 32, the Diviſor, is there in 210, the Dividual; or eaſier, how many times 3 in 21? ☞ For obſerve well, That whenever you have a Place more in the Dividual than in the Diviſor, then always ſeek how oft you can take the firſt Figure of the Diviſor out of the two firſt of the Dividual, and the Anſwer is 7 times; but it will not bear 7 times, for 7 times 32 is 224, and you cannot take 224 out of 210; or rather, you cannot take 22 out of 21; wherefore try in your Mind before you ſet down the Anſwer, or Figure in the Quotient, whether it will go to the Number of Times as is moſt eaſily ſuggeſted; as here the Queſtion or Demand is readily anſwer'd 7 times; and ſo many times 3 may be taken in 21; but when you come to multiply the whole Diviſor by the times you place in the Quotient, you begin at the Right-hand, and go towards the Left, carrying the Tens that ariſe to the next Place, which increaſes the Product ſo, that ſometimes Subtraction cannot be made, becauſe the under Line is greater than the upper, or that which you ſhould ſubtract from; wherefore firſt try in your Mind as aboveſaid; and ſince it will not bear 7 times, try if it will go 6 times; ſaying 6 times 2 is 12, 2 and carry 1, and 6 times 3 is 18, and 1 is 19; and 19 may be taken out of 21, therefore ſet down 6 in the Quotient next to the 4, and multiply the Diviſor 32 by it, and the Work will ſtand thus:

32) 78901 (346
64···
149
128
210
192
181

Here the Diviſor 32 multiplied by 6, gives 192 to be taken out of 210, and the Remainder is 18; to which, after a Point made under it, I bring down the 1, the laſt Figure of the Dividend, and then there is 181 for a new Dividual; then according to the Rule, I ſeek again (for you are to note, That the aforeſaid *General Rule for working* muſt be as often repeated as you bring down a Figure or Cypher from the Dividend, to make a new Dividual; and alſo, that for every Figure or Cypher brought down, there muſt likewiſe be a Figure or Cypher placed in the Quotient) how many times 32 the Diviſor may be taken out of 181 the Dividual; or how many times 3 in 18, and the ready Anſwer is 6 times; but on the Trial I find it will not go 6 times, wherefore I try a time leſs by 1, *viz.* 5 times, and find it will bear it; and ſetting 5 in the Quotient next to the 6, I multiply the Diviſor 32 by it, and it produces 160; which ſubtracted from 181, the laſt Remainder is 21, and the Quotient or Anſwer is 2465; and ſhews that 32 is contained in 78901, 2465 times, and 21 over, as *per* Work.

```
32) 78901 (2465
    64·· 
    ----
    149
    128
    ----
     210
     192
     ---
      181
      160
      ---
      (21)
```

Again, admit a Nobleman hath 30,000*l. per Annum*, what is his daily Income?

If you divide 30000 by 365 (the Days in a Year) the Quotient will be the Anſwer. Set it down for working thus,

365) 30000 (

Firſt, ſeek how many times 365 can be taken in 300? (an equal Number of Places with the Diviſor) anſwer 0 times; wherefore I go a Place farther to the Right-hand, in the Dividend (for 0 muſt never begin the Quotient, as was ſaid before) and make a Point under it, *viz.* under the laſt 0 but one, as may be ſeen in the Example; and there being a Place more in this pointed out Dividual than in the Diviſor, I ſeek how oft the firſt Figure of the Diviſor, *viz.* 3, is contained in the two firſt Figures or Places of the Dividend, *viz.* 30, and the Anſwer is 10 times; but you are never to take above 9 times at once, in any of theſe Examples of Diviſion, wherefore try in your Mind whether it will bear 9 times, before you ſet it down in the Quotient (as was ſaid before) ſaying to yourſelf, or in your Mind, 9 times 5 is 45; 5 and go 4; 9 times 6 is 54, and 4 is 58; 8 and go 5; and 9 times 3 is 27, and 5 is 32; now 32 cannot be taken out of 30, wherefore take a time leſs by a Unit or one, *viz.* 8 times; and finding it will go 8 times, ſet down 8 in the Quotient; and then ſay, 8 times 5 is 40; 0 and carry 4, and 8 times 6 is 48, and 4 is 52; 2 and carry 5;

and 8 times 3 is 24, and 5 is 29; and then there is 2920 to be taken from 3000; and after Subtraction, the Work appears thus:

365) 30000 (8
2920
——
80

Then to the Remainder 80, I bring down 0, the laſt of the Dividend, and then there is 800 for a new Dividual; then you muſt try how oft you can take 365 out of the ſaid Dividual 800, and the Number of Places being equal to both in Diviſor and Dividual, to wit, 3, aſk how oft 3 in 8; anſwer twice; ſo put 2 in the Quotient, and ſay, twice 5 is 10; 0 and carry 1; and twice 6 is 12, and 1 is 13; 3 and carry 1; and twice 3 is 6, and 1 is 7; ſo there is 730 to be deducted from 800, and the Remainder is 70, as in the whole Work may be ſeen, *viz.*

365) 30000 (82
2920·
——
800
730
——
(70)

Thus by the Work the Nobleman hath Eighty-two Pounds *per Diem*, and 70 Pounds over; which if multiplied by 20, the Shillings in a Pound, would produce 1400 Shillings; which if divided *per* ſaid Diviſor 365, there would come out 3*s.* a Day more, and there will be a Remainder of 305, which multiplied by 12, the Pence in a Shilling, produces 3660; which divided ſtill *per* 365, gives 10 Pence a Day more: So that 30000*l.* a Year is *l.* 82—3—10 a Day.

Once more, Divide 46242 Gallons of Canary by 252, the Gallons in a Tun, thus ſet down:

252) 46242 (183
252··
——
2104
2016
——
882
756
——
(126)

In this Example, after Enquiry, I find that it will not go twice, therefore I ſet down 1 in the Quotient, and place 252 under 462 of the Dividend, and after Subtraction the Remainder is 210; to which I bring down 4 from the Dividend, and the Dividual is 2104; and then ſeeking again, find it will bear 8 times; which placed in the Quotient, and the Diviſor 252 multiplied by it, the Product is 2016 to be ſubtracted from 2104; which being done, the Remainder is 88; to which 2, the laſt Figure of the Dividend, being brought down, there is 882 for the laſt Dividual; and then ſeeking again, I find it will go 3 times; and the Product of the Diviſor multiplied by 3, is 756; which ſubtracted from 882, there remains 126 for the laſt, or true Remainder: So that by this Diviſion, I find there are 183 Tuns in 46242 Gallons, and 126 Gallons remaining, or over and above; which being half of 252 the Diviſor, the Remainder is therefore half a Tun more.

When you have a Cypher or Cyphers in the Diviſor, in the Firſt, Second, or Third Place, *&c.* ſeparate ſuch Cypher or Cyphers, with a Daſh of the Pen, from the reſt of the Diviſor; and alſo cut off as many Figures or Cyphers from the Right of the Dividend, as you cut off Cyphers from the Diviſor, and divide the remaining Figures towards the Left-hand by the remaining ſignificant Figures of the Diviſor.

Example.

Divide 47952 Square Poles of Land by 160, the Square Poles in an Acre of Land.

16|0) 4295|2 (268
32··
109
96
135
128
(7)

Here the Cypher is cut off from the Diviſor, and 2 from the Dividend; then I aſk how oſt 16 in 42; anſwer twice; then the 16's in 109, anſwer 6 times; then the 16's in 135, anſwer 8 times. So there are 268 Acres, and 7 remains; that is 268 Acres, $\frac{7}{16}$ or $\frac{72}{160}$ or almoſt half an Acre.

Divide 27|00) 62746|20 (2323$\frac{25}{27}$ or $\frac{2520}{2700}$
54···
87
81
64
54
106
81
(25)

In this Example, two Cyphers are ſeparated from the Diviſor, and alſo two Places from the Dividend, and then 62746 is divided only by 27. See the Work.

When the Diviſor is 3, 4, 5, 6, or more Figures, there is a ſure and eaſy Way of performing the Work truly, by making a Table of the Diviſor; which may be done by *Addition*, or by multiplying the Diviſor by 2, 3, 4, *&c.* Admit you are to divide 987654321 by 123456.

123456) 987654321 (8000
987648 · · ·

(6321)

Here having noted the Number of Figures in the Diviſor, which here is 6, I make a Point under the Sixth Figure, or Place of the Dividend, *&c.*

Times	
1	123456
2	246912
3	370368
4	493824
5	617280
6	740736
7	864192
8	987648
9	1111104

The foregoing Table is made by doubling the firſt Line, which is 246912; which added to the firſt or uppermoſt Line, gives the 3d Line 370368; which alſo added to the ſaid firſt Line, makes 493824 for the 4th Line or Product; and ſo of the reſt; ſtill remembring to add the ſubſequent Line or Product to the firſt or uppermoſt Line, till you come to the laſt Line of 9 times, which is 1111104; the Truth of which may be proved by multiplying the firſt or uppermoſt Line by 2, 3, 4, 5, *&c.* and if you commit an Error by *Addition*, it may be found or corrected by *Multiplication*.

The Uſe of the ſaid Table.

When you have pointed out your Number of Places in the Dividend, caſt your Eye on the Table, and at the firſt View you may know how many times you can take, as in this Example, 7 times is too little, and 9 times too much; wherefore I ſet down 8 in the Quotient, and then multiply and ſubtract, and the Remainder is 6; to which

I bring down 3, and put 0 in the Quotient; then to the 63, I bring down 2, and place 0 in the Quotient; then to 632 I bring down 1, the laſt Figure of the Dividend; but ſtill it will not bear any Times or Time, wherefore I put another 0 in the Quotient; and ſo the Work is done, and the Quotient is 8000, and the Remainder 6321; as in the Work.

Thus having plainly, fully, and pertinently ſhewn, by verbal Directions, the Method of Working Diviſion; I think it unneceſſary to give any more Examples in that Manner, but ſhall leave ſome few Examples for Practice ſake, whoſe Quotients and Remainders are expreſſed, but the Operation omitted, to ſave Room, and for Trial of the Ingenuity of Practitioners.

7400690042 divided by 987, the Quotient is 7498166, and Remainder 200.

479679002742 divided by 4689, the Quotient is 102298704, and Remainder 4566.

7969767002 divided by 976294, the Quotient is 8163, and Remainder is 279080.

456789012345 divided by 9876543, the Quotient is 46249, and Remainder 8775138.

764697 by 4500, Quotes 169, and Remainder 4197. And 8092320000 by 345000, Quotes 23456, and remains (0).

The Proof of Multiplication and Diviſion.

THeſe two Rules reciprocally prove each other; for in proving *Multiplication*, if you divide the Product by the Multiplier, the Quotient will be like the Multiplicand; or if the Multiplicand, the Quotient will be the ſame with the Multiplier.

```
Ex. 1.     345
            24
          ----
          1380
          690
        ------
    24) 8280 (345
        72..
        ----
         108
          96
         ---
         120
         120
         ---
         (0)
```

```
Ex. 2.   Or thus,

    345) 8280 (24
         690.
         ----
         1380
         1380
         ----
          (0)
```

To

To prove Diviſion.

Diviſion may be proved by Diviſion, thus:

If you divide the Dividend by the Quotient, the Quotient will be your former Diviſor

Example.

Divide 8280 by 345.

345) 8280 (24

Here the Working again is needleſs, it being in the Page foregoing; and ſhews the Truth of the Aſſertion, that *Diviſion* may be proved by *Diviſion*, as aforeſaid.

But the moſt uſual Way of proving *Diviſion* is by *Multiplication* in this manner, *viz.* multiply the Quotient by the Diviſor, and the Product will be equal to the Dividend. Example of one in the foregoing Page.

345 *Quotient*
24 *Diviſor*
——
1380
690
——
8280 *Proof.*
——

Note, That when there is any Remainder, ſuch Remainder muſt be taken in, or added to the Product.

As in *Multiplication*, I gave ſome Examples of its Utility in Money, ſo likewiſe I ſhall give a few Examples in *Diviſion of Money*; whereby may be ſeen how expeditiouſly ſome Things may be done, without having Recourſe to Reduction, the Rule of Three, *&c. viz.*

Example 1.

Divide 26 *l.* 12 *s.* 6 *d.* equally among Five Men: For Diſpoſition of working, ſet it down as follows.

l. *s.* *d.*
5) 26—12—6
————
5—06—6
5
————
Proof 26—12—6
————

In the working of this, I ſay, the 5's in 26, 5 times; 5 times 5 is 25, from 26, and there remains 1, or 1 Pound, or 20 Shillings; which with the 12 *s.* in the Place of Shillings, makes 32 *s.* then the 5's in 32, 6 times; 6 times 5 is 30, from 32, and there remains 2 *s.* or 24 *d.* which with the 6 *d.* in the Place of Pence, makes 30; then the 5's in 30, 6 times; and ſo the Work is done, and the Anſwer is, that each Man muſt have *l.* 5—06—06 for his equal Share in the ſaid Diviſion of *l.* 26—12—6 amongſt 5 Perſons; and the Truth of it is proved by Multiplication of Money, ſufficiently ſhewn in the Rule of Multiplication; as here, 5 times 6 is 30; 6 and carry 2; and 5 times 6 is 30, and 2 is 32; 12 and carry 1; and 5 times 5 is 25, and 1 is 26, *&c.*

Example 2.

Divide the Charges of a Country Feaſt, amounting to *l.* 246—13—4 equally amongſt 12 Stewards, to know what each Steward muſt pay.

l. *s.* *d.*
12) 246—13—4
Anſwer 20—11—1$\frac{4}{12}$

Here I ſay, the 12's in 24 twice, and the 12's in 6, 0 times, and there remains 6 *l.* or 120 *s.* and 13 *s.* make 133; and then the 12's in 133 is 11, and there remains 1 *s.* or 12 *d.* then 12 and 4 is 16; and the 12's in 16 once, and 4 remains; ſo that each Steward muſt pay *l.* 20—11—1$\frac{4}{12}$ or four twelfths of a Penny, ſomething more than a Farthing; and this may be proved as that above.

When any Quantity is ſuch a Number that any two Digits of the *Multiplication-Table*, multiplied together, make the ſaid Quantity or Number, then the Quotient may be very expeditiouſly found at two Diviſions, and ſooner than at one. *Example:* Divide 7872 by 32. In this Example, the Digits, or component Parts, are Ratio's, which multiply'd together, make the Diviſor 32, and 4 and 8, or 8 and 4; for it matters not which of the Ratio's you divide by firſt; for either of which Diviſions give a true, and the ſame Quotient; as may be ſeen by the different Methods of the following Work.

4) 7872
8) 1968
246 *Quotient.*

Or thus, 8) 7872
4) 984
246 *Quotient.*

Here though the Operations are divers, yet the *Quotients* are one and the ſame. Again, divide 44184 by 56.

Example 2.

7) 44184

8) 6312

789 *Quotient.*

Here the *Diviſors* are 7 and 8, or 8 and 7; for either, or both, will give the ſame *Quotient*.

And thus may above Forty Examples be wrought by Numbers out of the *Multiplication-Table*, with great Diſpatch and Expedition, as by 15, 18, 25, 35, 64, 72, 96, &c.

When it happens there is any Remainder in the firſt Diviſion, or the laſt, or in both; to know the true Remainder as if you divided by the common Way, take this Method, *viz.* multiply the firſt Diviſor by the laſt Remainder, and to it take in or add the firſt Remainder, if there be any, and the Product will be the true or ſame Remainder as if you divided by the long Way. *Example*; divide 4567 by 15.

3) 4567

5) 1522—1

304—2

(7)

Here I multiply 3, the firſt Diviſor by 2, the laſt Remainder, and take in 1, the firſt Remainder, and it makes 7 for the true Remainder, as may be proved at leiſure, by the other Way.

The ſame Obſervation and Method muſt be taken with reſpect to component Parts mentioned before, in Diviſion of Money, as in Diviſion of ſimple Numbers.

Example.

3) *l.* *s.* *d.*

Divide 463—18—06 into 18 equal Parts.

6) 154—12—10

Anſwer 25—15—05$\frac{4}{18}$

By this Method of *Diviſion of Money* (if the Quantity be as aforeſaid made by even component Parts) you may, by having the Price of ſeveral Things, know the Price or Value of one Thing, at the ſaid Rate, as well as by the *Rule of Three:* So doth *Multiplication of Money* anſwer Queſtions in the *Rule of Three*, when the firſt Number is a Unit or One.

Example by Diviſion.

7) *l.* *s.* *d.*

If 84 *lb.* of Coffee coſt 31—10—0 what is that a *lb*?

12) 4—10—0

Anſwer 0—07—6 *a Pound.*

As in the Multiplication of Money, to have an Anſwer, you multiply the Price by the Quantity; ſo in Diviſion of Money, you divide the Price by the Quantity, to have your Anſwer.

I could ſpeak more largely, if I had Room, of the excellent Uſes that may be made of *Multiplication* and *Diviſion* only; but their various Uſes will be better underſtood by their Application in the following Rules of *Arithmetick*, particularly in the next Rule, call'd,

REDUCTION;

WHICH is an Application of *Multiplication* and *Diviſion*, ſhewing how to reduce Numbers of one Denomination to another, thereby diſcovering the ſame Value, tho' in different Terms.

1. As firſt, All Great Names are brought into Smaller by Multiplication, as Pounds into Shillings, Pence, or Farthings, by multiplying by 20, 12 and 4. Or Hundreds Weight into Pounds Weight, by multiplying by 4 and by 28, or by 112; or lower, into Ounces or Drams, by multiplying by 16 and 16.

2. And on the contrary, All Small Names are brought into Greater by Diviſion; as Farthings into Pounds, by dividing by 4, 12, and 20; and Pounds Weight into Hundreds Weight, by dividing by 28 and 4; the Drams into Pounds, by dividing by 16 and 16.

But you may note, That Pounds only are brought into Pence, by multiplying by 240; or into Farthings, by multiplying by 960; and juſt the contrary by Diviſion.

And for Weight, as expreſſed above.

The Senſe, Meaning, and Uſe of *Reduction*, is expreſſed in the following Verſes,

Reduction *ſhews how we of Names in Uſe,*
May Great to Small, and Small to Great, reduce;
So that the Anſwer which ſhall thence ariſe,
The given Sum in Value equalize;
Multiply, or divide it, back you muſt;
Which makes again your given Number juſt.

Example 1.

In 240 *l.* Sterling how many Pence?

20 Shillings 1 Pound.	*Or thus,*
4800 Shillings in 240 *l.*	240 *l.*
12 Pence 1 Shilling.	240 *d.* in a *l.*
Anſw. 57600 Pence in 240 *l.*	9600
	480
	Anſwer 57600

Example 2.

In 226 Tuns of Copper how many Pounds Wt?

20 C. 1 Tun.	*Or thus,*
4520 Hund. Wt. in 226 Tuns	226 Tuns
4 qrs. 1 C.	20
18080 qrs. of a C. Wt. in 226 Tuns	4520
28 lb. 1 qr. of a C.	112
144640	54240
36160	4520
506240 Pounds Wt. in 226 Tuns	506240 Pounds.

Theſe foregoing Examples are Great Names to be brought into Small (as may eaſily be obſerved and underſtood;) therefore, as the firſt Rule directeth, it is done by Multiplication, by multiplying the greater Name by the Number of the next leſſer Name that makes one of the ſaid greater; as in the laſt Examples the leſſer Name to Pounds is Shillings;

lings; wherefore I multiply by 20, becauſe 20 of that leſſer Name make one of the ſaid greater Name, *i. e.* 20 Shillings make a Pound. And the ſame regard is had, and Method obſerved, in the Example of Weight; as is very plain to be ſeen in the Work, and is called *Reduction Deſcending*, becauſe it brings Higher or Greater Denominations into lower or leſſer.

4) *Example* 3.

Bring 494400 Farthings into Pounds.

12) 123600 Pence.

2|0) 1030|0 Shillings.

515 Pounds.

Or thus:

96|0) 4944|0 (515 *l.*
480··

144
96

480
480

(0

In this Way I divide by 960 the Farthings in a Pound, *&c.*

In the firſt Way, I divide the Farthings by 4, becauſe 4 of them make a Penny, and the Quotient is Pence; then theſe Pence I divide by 12, becauſe 12 of them make a Shilling, and that Quotient is Shillings; which Shillings I divide by 20, to bring it into Pounds, thus; I cut off the Cypher in the Dividend towards the Right, for the Cypher that is in the Diviſor 20, which is alſo ſeparated from 2 with a Daſh of the Pen (as may be ſeen in the Work;) then I halve the Figures one by one, as they are united with the Remainder in the Dividend; which half is Pounds, and is a ſhort way of dividing by 20: In the Example I ſay, the half of 10 (becauſe I muſt not ſet down 0 at the Beginning) is 5, and the half of 3 is 1, and there remains 1; which makes the next, which is 0, 10; and the half of 10 is 5: So that 10300 Shillings make 515 Pounds, or there are ſo many Pounds in 494400 Farthings.

Note, In dividing by 20, as above, if any thing remains, it muſt be joined or annexed to the Figure or Cypher cut off; as ſuppoſe there had in halving the laſt Figure (excepting what you cut off) remained 1; which there doth never more, and then neither, but when the Figure halveth odd:

I ſay, if there had remained 1, then it muſt have been joined to the Cypher ſeparated or cut off, and then there would have been 10 Shillings.

Example 1.

Reduce 27552 Pounds Weight into Hundreds Wt.

```
        4)
28) 27552 (984
    252··  ———
   ——————  246 C. wt. Anſwer.
     235   ———
     224
     ———
     112
     112
     ———
     (0)
```

```
Or thus,
  l.
112) 27552 (246 Anſ.
     224··
     —————
      515
      448
      ———
      672
      672
      ———
      (0)
```

In the firſt of the two foregoing Examples I divide the Pounds by 28 to bring them into Quarters; then I divide thoſe Quarters by 4, to bring them into Hundreds Weight, as in the Work.

In the ſecond Way, I divide the Pounds Weight by 112, the Pounds in a C. Weight, and it brings the Pounds Weight into Hundreds Weight at once.

The ſaid Examples are of ſmall Denominations to be brought into Greater; and therefore according to the ſecond Rule of Direction, it is done by Diviſion, by dividing the leſſer Name by as many of them as make the next greater Name; that is by 28, becauſe 28 of them make one of the next greater Name, *viz.* a Quarter of a Hundred; and this Reduction is called *Reduction Aſcending*, becauſe it brings low or ſmall Names to higher or greater Denominations.———By which may be obſerved, That all Queſtions in Reduction, whether Aſcending or Deſcending, are anſwered either by Multiplication or Diviſion, or by both; as will plainly appear in the ſundry Examples of Reducing of divers Denominations to others.

When it is required to reduce Numbers of ſeveral Denominations by *Reduction Deſcending*, or by *Multiplication*, you are to work as before; but you muſt always remember to take in ſuch Numbers as ſtand in the Place of the next

inferio

inferior Denomination ; as when you multiply the Pounds by 20, if there be any Shillings in the Denomination or Place of Shillings, you muſt take them in : So likewiſe when you multiply the Shillings by 12, if there be any Pence in the Place of Pence, you muſt alſo take them in : And ſo when you multiply the Pence by 4, to bring them into Farthings, you muſt take in the Farthings, if there be any, in the Place of Farthings, as in the following Work.

Example 5.

l. *s.* *d.*
In 346—16—9 $\frac{1}{2}$ how many Farthings ?
20 Shillings 1 Pound.

6936 Shillings in 346 *l.* 16 *s.*
12 Pence 1 Shilling.

83241 Pence in 346 *l.* 16 *s.* 9 *d.*
4 Farthings 1 Penny.

332965 Farthings in 346 *l.* 16 *s.* 9 *d.* $\frac{1}{2}$

The Example is ſo plain in the Work, that it hardly needs any Explication ; but I begin to ſay 0 is 0, but 6 in the Units of Shillings is 6 ; then twice 6 is 12 ; and 1 in the Tens of Shillings is 13 ; 3 and carry 1 ; and twice 4 is 8, and 1 is 9 ; and twice 3 is 6 ; then by 12, ſaying 12 times 6 is 72, and 9 *d.* (in the Place of Pence) is 81 ; 1 and carry 8 ; and 12 times 3 is 36, and 8 is 44 ; 4 and carry 4 ; and 12 times 9 is 108, and 4 is 112 ; 2 and carry 11 ; and 12 times 6 is 72, and 11 is 83, *&c.*

Example 6.

C. *qrs.* *lb.*
56—2—16 of Tobacco, how many Pounds Weight ?
4 qrs. 1 *C.*

226 qrs. in 56 C. 2 qrs.
28 lb. 1 qr. of a C.

1814
453

Anſ. 6344 Pounds Weight in 56 *C.* 2 *qrs.* 16 *lb.*

In the foregoing Work, I firſt multiply the 56 *C.* by 4, and take in two Quarters; and then I multiply the 226 qrs. by 28, ſaying, 8 times 6 is 48, and 6 (the Unit Figure in the odd Pounds) is 54; 4, and carry 5, *&c.* Then I multiply by 2, ſaying twice 6 is 12, and 1 (that ſtands in the Place of Tens in the odd Pounds) is 13; 3, and carry 1, *&c.* Then adding the two Products together, they make 6344 Pounds, contained in 56 *C.* 2 *qrs.* 16 *lb.* as in the Work is conſpicuous. Or, the Example may be ſooner done by multiplying the 56 *C.* by 112, the Pounds in a C. Wt. and taking in the odd Weight, *viz.* 2 *qrs.* 16 *lb.* or 72 Pounds at once, thus:

C.
56
112
——
672
56,72 *odd Weight.*
——
6344
——

I ſay here, 12 times 6 is 72; 2 and carry 7; and 12 times 5 is 60, and 7 is 67; then once 6 is 6, ſetting it down in the third Place, becauſe by multiplying by 12 at once, two Places are taken up; See the Work.

Or, ſtill briefer thus, by ſetting down the 56 *C.* four ſeveral times, in the following manner; taking in the odd Weight, as before.

56 *C.*
56
56
56,72
——

The ſame as above, *viz.* 6344 Pounds.

——

Reduction Aſcending

Is the bringing Numbers from a leſſer Denomination to a greater, and is the Reverſe of *Reduction Deſcending*; and each may ſerve as a Proof to the other, one being performed by *Multiplication*, and the other by *Diviſion*.

And note, That when at any Time in *Reduction Deſcending* you take in, or add to, the odd Money, Weight, or Meaſure, as you multiply the ſeveral Denominations, ſuch Quantities will be Remainders in *Reduction Aſcending*.

Example by the two foregoing Sums.

4)
In 332966 Farthings, how many Pounds?
12) 83241 — ½ *d.* remains what taken in.
2,0)693,6 — 9 *d.* remains what taken in.
346 — 16 *s.* remains what taken in.

So that in 332966 Farthings there are 346 *l.* 16 *s.* 9 *d* ½, and is a ſure Proof of the foregoing Work deſcending.

Again, in 6344 Pounds Weight, how many Hundreds Weight?

4)
28) 6344 (226 *qrs.*
56 · ·
74 56 *C.* 2 *qrs.* taken in.
56
184
168
(16) remain Pounds taken in.

So that in 6344 Pounds Weight, there is 56 *C.* 2 *qrs.* 16 *lb.* and proves the foregoing Example deſcending to be right.

Now follow promiſcuous Examples of both kinds of Reduction, one proving the other.

In 276 *l.* 12 *s.* how many Pence?

20
5532
12
Anſ. 66384 *d.*

12
In 66384 *d.* how many Pounds?
2|0) 553|2
Anſ. l. 276|12 and *Proof.*

In 47964 Grains, how many Pounds *Troy*?

20)
24) 47964 (199|8
24 · · 12)99—18 Pwts.
239
216
236
216
204
192
Gr.(12)

In 8 *lb.* 3 *oz.* 18 *pwt.* 12 *gr.* *Anſwer* how many Grains?
12
99
20
1998
24
7994
3997
Anſwer 47964 and *Proof.*

In 34 *C* $\frac{3}{4}$ of Cotton Wool, how many Pounds?

```
  34                          112) 3892 (34 C. 3/4 Proof.
  34                               336·
 34                                ----
34|84                               532
----                                448
3892 Pounds                         ---
-----                              (84) lb. or 3/4 of a C.
```

In 456 *C.* 3 *qrs.* 27 *lb.* of Copper, how many Pounds? And what comes it to, at 21 *d. per lb.*

```
   456 C.
   456                  Or thus,
  456                       C.
 456                       456
   111                     112
 -------                   ---
 51183 Pounds.            5472
    21 d. per lb.         456
 ---------                ,111
  51183                   -----
 102366                   51183 Pounds
 -------
```

1074843 Pence; which bring into Pounds by *Diviſion* or *Reduction Aſcending*, as before ſhewn, and it will amount to *l.* 4478 : 10 : 3.

Bring 4796 Ells *Flemiſh* into Ells *Engliſh*; multiply by 3, and divide by 5, becauſe 3 Quarters make an Ell *Flemiſh*, and 5 an Ell *Engliſh*.

```
      4796
         3
  ---------
5)   14388
  ---------
     2877 3/5
```

Reduce 456 Ells *Engliſh* into Yards; multiplyby 5, and divide by 4, thus:

```
      456 English Ells
        5 qrs. 1 Eng. Ell.   In 570 Yds. how many Eng. Ells?
   -------                            4 qrs. 1 Yd.
4)   2280 qrs                 -------
   -------                    5) 2280
Yds.  570 Answer                 ------
   -------              English Ells 456 Answer and Proof.
```

Bring 130 Tuns of Wine into Gallons.
4 Hogſheads 1 Tun.

520
63 Gallons 1 Hogſhead.

1560
3120

Anſ. 32760 Gallons.

Or thus.
252 Gallons 1 Tun.
130 Tuns.

7560
252

32760

And ſo the contrary by *Diviſion.*

	Laſts.	*Quarters.*	*Buſhels.*	*Pecks.*
Reduce	42 ——	3 ———	5 ——	2 into Pecks.

10 qrs. 1 Laſt

423 qrs.
8 Buſhels 1 qr.

3389
4 Pecks 1 Buſhel

13558 Pecks, in 42 Laſts, 3 Quarters, 5 Buſhels, and 2 Pecks.

Here I multiply by 10, and take in 3 *qrs.* and then by 8, and take in 5 *Buſhels*; and laſtly by 4, and take in 2 *Pecks.*

4)
In 13558 Pecks, how many Laſts, *&c?*

8) 3389 2 Pecks taken in.

1|0)42|3 5 Buſhels taken in.
Laſts 42 3 Quarters taken in.

Anſwer. 42 Laſts, 3 Quarters, 5 Buſhels, and 2 Pecks.

Thus by the two foregoing Examples it is ſeen, that *Reduction Aſcending* and *Deſcending* mutually prove each other, as was ſaid before; and is no more, than that *Multiplication* and *Diviſion* prove one another.

By *Reduction* alſo,

Foreign Coins or Exchanges may be reduced to Sterling Money; and on the contrary, Sterling Money to Foreign.

Example.

Reduce 246 *Venetian Ducats de Banco* into Sterling Money, the Exchange at 52 *d.* Sterling *per* Ducat, thus:

```
          246
           52
        -----
          492
         1230
        -----
     12) 12792
        -----
     2|0) 106(6
        -----
```

l. 53,6 To be paid in *London,* for the 246 Ducats drawn in *Venice.*

Reduce 53 *l.* 6 *s.* Sterl. into Ducats at 52 *d.* Sterl *per* Ducat.

```
       20
     ----
     1066
       12
   ------
52) 12792 (246 Ducats to be paid in Venice for the 53 l. 6s.
    104                     drawn in London.
    ---
    23,&c.
```

To reduce *Flemiſh* Money into *Sterling* Money, divide the Pence *Flemiſh* by the Par of Exchange, *viz.* 33 *s.* 4 *d.* and the Quotient will be the *Sterling* Money; and what remains multiply by 20, *&c.*

Example.

In 242 *l.* 13 *s.* 4 *d.* *Flemiſh*, how many Pounds *Sterling*, &c.?

```
                             20
                          -----
33 s. 4 d. Flemiſh.        4853
12                           12
---                 -----------
400                 4|00)582|40
                    -----------
                l.   145 Sterling.
     Remains         240
                      20
                    -----------
                    4|00)48|00
                    12 Shillings Sterling.
```

By the Work it appears that 145 *l.* 12 *s. Sterling*, anſwers or is equivalent to 242 *l.* 13 *s.* 4 *d. Flemiſh*, at 33 *s.* 4 *d. Flemiſh*, *per* Pound *Sterling*.

Thus *Flemiſh* Money may be reduced to *Sterling* Money, though the Par of Exchange be at any other Rate of Shillings and Pence *Flemiſh:* But when at the Rate, as above, *viz.* 33 *s.* 4 *d.* (the common Par) then the Anſwer is ſooner found by multiplying by 3, and dividing by 5; for 400 *d. Flemiſh* is the ſame to 240 *d. Sterling* (each being a Pound) as 3 is to 5; for if you divide 240 by 3, it quotes 80: So 400 divided by 5, quotes the ſame.

The foregoing *Example* done by the laſt propoſed Way.

l. 240—13—4 *Flemiſh.*
3
5)722—00—0
l. 144—08—0

Note, *French* Money is reduced to *Sterling*, *viz. Livres*, *Sols*, and *Deniers*, (or *French* Pence) as *Sterling* and *Flemiſh* Money is, by multiplying by 20 and by 12.

In 426 *French* Crowns, each 54 *d.* $\frac{1}{4}$ *Sterling*, how many Pounds, &c. *Sterling?*

426
54
1704
2130
106$\frac{2}{4}$ or $\frac{1}{2}$ *d.*
12)23110: 10 *d.*
2|0) 192|5
Anſwer *l.* 96 : 5 : 10 $\frac{1}{2}$ *Sterl.*

In this Example, the Number of Crowns is multiplied by 54 *d.* and for that I take the 4th Part of 246, which is 106$\frac{2}{4}$ of a Penny, or a Half-penny; which added to the other Pence, give for Total 23110 *d.* which divided by 12, quotes 1925, and 10 *d.* remains; ſo the Anſwer is 96 *l.* 5 *s.* 10 *d.* $\frac{1}{2}$ *Sterling:* As in the Work.

Again, Bring 1600 Pieces of Eight *Mexico*, at 54 *d.* $\frac{1}{4}$ *Sterling*, into Pounds, &c. *Sterling?*

1600
54
6400
8000
200
200
12) 86800 Pence.
2|0(723|3—4
l. 361 : 13 : 4

Here the 1600 Pieces of Eight are multiplyed by 54, to bring them into Pence; and for the $\frac{2}{8}$ I take the $\frac{1}{8}$ of 1600 twice, *&c.* as in the Work. And the Anſwer is *l.* 361 : 13 : 4.

This Method is of Uſe in reducing the Exchanges of *Cadiz*, *Leghorn*, and *Genoa*. Or when the Exchange is at ſo many Pence, and Eighths of a Penny, (as often the Exchanges run) then multiply the given Number to reduce it into Pence, by the Pence contained in a Piece of Eight; and alſo multiply the ſaid given Number apart, by the Numerator or upper Figure of the Fraction, and divide by the Denominator or under Figure of the Fraction, and the Quotient will be Pence; which add to the other Pence produced by multiplying the given Number by the Pence contained in one of the Pieces for Exchange; then divide the total Pence by 12, *&c.*

Example.

Bring 296 Dollars, at 52 *d.* $\frac{6}{8}$ *Sterling*, into Pounds, *&c.* *Sterling?*

296
52
592
1480
15392
222
12) 15614
2|0) 1'30| 1—2

296 Dollars.
6
8) 1776
222 Pence.

Anſwer *l.* 65 : 1 : 2 *Sterling* Money due for 296 Dollars, at 52*d.* $\frac{6}{8}$ *Sterling per* Dol.

But

But *Ducats, Dollars, Crowns, Millreas*, &c. are more expeditiouſly caſt up by the Rules of Practice hereafter to be ſhewn.

And ſo much for *Reduction*. The next Rule in *Arithmetick* is

The GOLDEN RULE, *or* RULE OF THREE.

IT is called the *Golden Rule* from its excellent Performances in *Arithmetick*, as in other Parts alſo of *Mathematical* Learning.

And the *Rule of Three* becauſe from three Numbers given, propoſed, or known, we find out a fourth Number required, or unknown, which bears ſuch Proportion to the third as the ſecond doth to the firſt Number. From whence alſo it is called *The Rule of Proportion*.

And of this *Proportion* there are two ſorts; one called *Direct*, and the other *Indirect*, or *Reverſe*.

Direct Proportion is, when the ſecond and third Numbers are multiplied together, and their Product is divided by the firſt.

Indirect, or *Reverſe Proportion* is, when the firſt and ſecond Numbers are multiplied together, and their Product is divided by the firſt.

In *Direct Proportion*, the fourth Number, or Anſwer to the Queſtion, contains the third Number as often (or as many times) as the ſecond contains the firſt.

But in *Indirect Proportion*, the greater the third Number is, the leſs is the fourth; and the leſſer the third Number is, the greater is the fourth.

The Stating the Queſtion.

The chiefeſt Difficulty that occurs in the *Rule of Three*, is the right placing the Numbers, or ſtating the Queſtion: For when that is done, you have nothing more to do, but to multiply and divide, and the Work is done.

And to this End, we are to remember, that of the three given Numbers, two of them are always of one Name or Denomination; and the other Number is ever of the ſame Name with the fourth Number or Anſwer required; and muſt always be the ſecond or middle Number: And the Number that aſketh the Queſtion, muſt ſtill poſſeſs the third or laſt Place; and the other Number of the ſame Name with the third, muſt be the firſt Number: For, the firſt and third Numbers muſt always be of one Name, *viz.* both Money, both Weight, both Time, or both Meaſure. And though they be of one Kind, yet if one of them is altered, by *Reduction*, from a high to a lower Name, then the other muſt be reduced to the ſame Name. For you muſt particularly note, *That if either the firſt or third Numbers conſiſt of ſeveral Denominations, that is, of Pounds and Shillings; or Pounds, Shillings, and Pence; or of Pounds, Shillings, Pence, and Farthings; or of Tuns, Hundreds, Quarters, and Pounds,* &c. *then muſt they be reduced to the loweſt Name mentioned. And if one happen to be of divers Denominations, and the other but of one Name; then the Number of one Name muſt be reduced as low, or into the ſame Name with the other: As ſuppoſe the firſt Number is brought into Farthings, then the third Number, though but Pounds, muſt be brought into Farthings alſo. Then you are to multiply the ſecond and third Numbers together, (when the Proportion is Direct) and divide the Product by the firſt Number, and the Quotient thence ariſing will be the Anſwer to the Queſtion, and in the ſame Name with the Middle Number: And if in a ſmall Denomination, it muſt be brought by Diviſion to the higheſt Name, for the better underſtanding the Anſwer.* You muſt alſo note, *That if the Middle Number be of ſeveral Denominations, it muſt be brought into the loweſt mentioned.*

Example 1.

If 12 Gallons of Brandy coſt 4 *l.* 10 *s.* what will 134 Gallons coſt at that Rate?

Stated for working thus:

```
Gallons.        l    s.        Gallons.
If 12 ———————— 04 — 10 ————————— 134
               20                  90
               ——              —————
               90            12) 12060
                               —————
                              2|0) 100|5
                               —————
                                l.50|5 Anſwer.
                               —————
```

Here the firſt and third Numbers are of like Names, *viz.* both Gallons; and 134 being the Number that aſketh the Queſtion, it hath the third Place, as it always muſt, as before aſſerted; and 4 *l.* 10 *s.* the ſecond Number, being of two Denominations, *viz.* Pounds and Shillings, it is reduced into the loweſt mentioned, *viz.* Shillings, as before directed, and then the three Numbers are theſe, *viz.* 12—90—134; and 134 the third Number, being multiplied by 90, the ſecond Number, produces 12060; which divided by 12, the firſt Number, quotes 1005 Shillings, the Name of the middle Number 90: and 1005 Shillings, divided by 20, gives 50 *l.* 5 *s.* for the Anſwer: And for the Proof of its Truth, ſtate it back again thus:

Example 2.

Gal. *l.* *s.* *Gal.*
If 134 coſt 50—5 what 12.
20
——
1005
12
——
134) 12060 (90 *s.* *Anſwer*, or 4 *l.* 10 *s.*
1206 the Coſt of 12 Gallons, and
——— is a ſure Proof of the firſt Work; and the back ſtating and working the Proof is as much a Queſtion in the Rule of Three as the firſt.

By the foregoing Rules and Directions, and theſe two Operations, you may underſtand the Nature of the Rule, and Method of working, and with Eaſe and Certainty anſwer any Example propoſed in the Rule of Three direct: And therefore, I ſhall omit what I can of verbal Directions, and abate as much of Figure Work as is conſiſtent with Diſpatch, and of not leaving the Work too obſcure; to ſave room, and not to be too prolix; and to this End, I ſhall only give the Examples ſtated, and a little of the Work, and the Anſwers to the Queſtions, leaving moſt of the Operations to be performed by the ingenious Practitioners.

Example 3.

If 56 *l.* of Indico coſt 11 *l.* 4 *s.* what will 1008 *lb.* coſt at that Rate?

lb. *s.* *lb.*
If 56—224—1008? *Anſwer* 4032 *s.* or 201 *l.* 12 *s.*

Example 4.

If half a C. Wt. of Roſe Copper coſt 4 *l.* 18 *s.* what Quantity will 14 *s.* buy at that Rate?

s. *lb.* *s.*
If 98 buy 56 what 14? *Anſwer*, 8 *lb.* of Copper.

Example 5.

If 4 C. 3 qrs of Sugar coſt 5 *l.* 15 *s.* 7 *d.* what will 4 Hogſheads come to, weighing 42 C. 1 *q.* 14 *lb.*

If

lb. *d.* *lb.*

If 532—1387—4746? *Anſwer*, 12373 Pence, or 51 *l.* 11 *s.* 1 *d.* And the Remainder 266, multiplied by 4, gives 1064; which alſo divided by the firſt Number 532, gives a Half-penny more; ſo the whole is 51 *l.* 11 *s.* 1 *d.*$\frac{1}{2}$.

Any of theſe Examples, or any other, may be proved by a back ſtating, according as the firſt Example was proved; and each Proof becomes another Queſtion in the Rule of Three, as was ſaid before.

Example 6.

If I have 50 *l.* a Year Salary, how much is due to me for 144 Days Service at that Rate?

Days *l.* *Days.*

If 365—50—144? *Anſwer*, *l.* 19—14—6$\frac{90}{365}$ Parts of a Penny.

In this Example, the Product of the third by the ſecond Number is 7200; which dvided by the firſt 365, (according to the Rule) quotes 19 Pounds, the Name of the middle Number, and there is a Remainder of 265; which multiplied by 20, according to *Reduction*, and the Product ſtill divided by 365, there comes out 14 Shillings; and yet there is a Remainder of 190, which multiplied by 12, and the Product divided by 365, gives 6 *d.* and there's a Remainder 90; which multiplied by 4 (the laſt inferior Name) and divided by 365, yet it would not come to a Farthing more; ſo that the Anſwer is as above, *l.* 19—14—6$\frac{90}{365}$.

You are to note always, *That when any thing remains that is reducible to an inferior or lower Name, after multiplied as above, it muſt continually be divided by the firſt Number.*

Note alſo, *When the firſt of the three given Numbers is an Unit, or One, the Work is performed, or Anſwer found, by Multiplication.*

Example 7.

If I am to give 17 *s.* for 1 *lb.* of *Belladine* Silk, what muſt I give for 264 *lb.* at that Rate?

lb. *s.* *lb.*
If 1———17———264
17

Anſwer 4488 or 224 *l.* 8 *s.*

Example 8.

If I buy 49 Bags of Hops, at 12 *l.* 12 *s.* 6 *d.* *per* Bag, what come they to at that Rate?

Bag. *l.* *s.* *d.*
1———12—12—6———49 Bags.
7 and by 7.

88—07—6
7

618—12—6 *Anſwer.*

The foregoing Work is performed by the component Parts of *Multiplication of Money*, as taught in that Rule.

When the Third or laſt of the three given Numbers is an Unit or One, then the Work is performed by *Diviſion.*

Example 9.

If 12 Ells of Holland coſt 3 *l.* 6 *s.* what is the Price of 1 Ell at that Rate?

Ells 12) *s.* Ell
If 12———66———1 *Anſwer* 5 *s.* 6 *d.*

$5\frac{6}{12}$ of 1 *s.* or 6 *d.*

Example 10.

If 56 Yards of Broadcloth coſt 40 *l.* 12 *s.* what comes a Yard to at that Rate?

Yds. 7) *l.* *s.* Yd.
If 56———40—12———1 *Anſwer* 14 *s.* 6 *d. per* Yd.

8) 5—16

0—14—6 *d.* *Anſwer.*

This Example is wrought by *Diviſion of Money*, and by Component Parts; as before taught in the *Rule of Diviſion.*

Example 11.

If *A* owes *B* 296 *l.* 17 *s.* and compounds at 7 *s.* 6 *d.* in the Pound; what muſt *B* take for his Debt?

s. *d.* *s.*
If 20———90———5937 *Anſwer* *l.* 111—6—$4\frac{1}{2}$.

Example 12.

If a Gentleman hath an Eſtate of 500 *l.* a Year, what may he expend daily, and yet lay up 12 *l.* 15 *s.* *per* Month?

Firſt multiply 12*l.* 15*s.* *per* 12, the Months in a Year, and it makes 153*l.* which deducted from 500*l.* the Remainder is 347*l.* Then ſay,

Days.		*l.*	
If 365	———	347,	what 1 Day? *Anſwer* 19*s.*

After you have reduced the Pounds into Shillings, which make 6940, you divide them by 365, and the Quotient is 19*s.* *per* Day.

The Rule of Three Reverſe, or of Indirect Proportion.

WHAT *Indirect Proportion* is, hath been hinted already.

In *Direct Proportion*, the Product of the Firſt and Fourth Numbers, is equal to the Product of the Second and Third.

But in this *Proportion*, the Product of the Third and Fourth Numbers, is equal to the Product of the Firſt and Second.

The Method of ſtating any Queſtion in this Rule, is the ſame with that of the *Direct Rule*.

For the Firſt and Third Numbers muſt be of one Name, or ſo reduced, as in that Rule; and the Number that moves the Queſtion muſt poſſeſs the Third Place; and the Middle Number will be of the ſame Name with the Anſwer, as it is there.

To know when the Queſtion belongs to the Direct, *and when to the* Reverſe Rule.

When the Queſtion is ſtated as aboveſaid, conſider whether the Anſwer to the Queſtion ought to be more or leſs than the Second Number; if more, then the leſſer of the Firſt and Third Numbers muſt be your *Diviſor*.

But if Leſs, then the Bigger of the two extreme Numbers muſt be your *Diviſor*.

And if the Firſt Number of the Three is your *Diviſor*, then the *Proportion* is *Direct*; but if the laſt of the Three given Numbers is your *Diviſor*, the *Proportion* is *Indirect* or *Reverſe*.

Or without Regard, either to *Direct*, or *Reverſe*:

$$\left.\begin{array}{l}\text{If more is required, the Leſſer}\\\text{If leſs, the Greater}\end{array}\right\}\text{is } \textit{Diviſor.}$$

Examples for Explanation.

Example 1.

If 4 Men plane 250 Deal Boards in 6 Days; how many Men will plane them in 2 Days?

If 6 Days require 4 Men, what 2 Days? *Anſwer* 12 Men.

$$\begin{array}{r} 4 \\ 6 \\ \hline 2)\ 24 \\ \hline 12 \end{array}$$

12 *Anſwer.*

Example 2.

If a Board be 9 Inches broad, how much in Length will make a ſquare Foot?

	In. B.		In. L.		In. B.	
If	12	————	12	what	9	Inches broad?

$$\begin{array}{r} 12 \\ 12 \\ \hline 9)\ 144 \\ \hline \end{array}$$

Anſwer 16 Inches Length.

In this Example, the Firſt and Second Numbers are multiplied together, (as they always muſt be) and their Product is divided by the Third; as in the Example above it, and agreeable to the aforeſaid Aſſertion; for in the firſt Example, it is moſt certain, that 2 Days will require more Hands to perform the Work than 6 Days; therefore the Leſſer of the extreme Numbers is the *Diviſor*; and declares the Queſtion is in the *Indirect Proportion.*

Likewiſe in the Second Example, 9 Inches in Breadth muſt needs require more in Length to make a Foot, than 12 Inches in Breadth; wherefore it is in the *ſame Proportion* with the firſt Example, becauſe the *Diviſor* is the Third Number.

Example 3.

How many Pounds of Coffee, at 5 *s.* 9 *d. per lb.* is equivalent in Value with 246 Pounds of Tea, at 13 *s.* 4 *d. per lb.*

	d.		*lb.*		*d.*		*lb.*
If	160	give	426,	what	69?	*Anſwer*	987 $\frac{57}{69}$.

Here it is manifeſt that there muſt be more Pounds of the Coffee than the Tea; therefore 69 is the *Diviſor*, which is the Third Number, *&c.*

Example 4.

How many Yards of Sarcenet, of 3 *qrs.* wide, will line 9 Yards of Cloth, of 8 *qrs.* wide?

qrs.wide. yds.long. qrs.wide.
If 8 ———— 9 what 3
8
———
3) 72
———
Yards 24 *Anſwer.*

Here the narrower the Silk the more in Length is required.

Example 5.

If a Quartern Loaf weigh 4 *lb.* $\frac{1}{2}$ when Wheat is 5 *s.* 6 *d.* the Buſhel; what muſt it weigh when Wheat is 4 *s.* the Buſhel?

d. $\frac{1}{2}$ *lb.* *d.* *lb.*
If 66 ———— 9 ———— ———— 48 *Anſwer* $6\frac{3}{6}$

Example 6.

If in 12 Months 100 *l.* Principal gain 5 Pounds Intereſt; what Principal will gain the ſame Intereſt in 5 Months?

M *l. P.* *M.*
12 ———— 100 ———— ———— 5
12
———
5) 1200
———
Anſwer, 240 *l.* Principal.

The Double Rule of Three Direct.

IN this Rule there are Five Numbers given to find out a Sixth, in Proportion to the Product of the Fourth and Fifth Numbers, as the Third Number bears to the Product of the Firſt and Second Numbers.

Queſtions in this Kind of *Proportion* are wrought either by two Operations in the *Single Rule of Three Direct*, or by the Rule compoſed of the Five given Numbers, and the one may be a Proof to the other; as may be ſeen in the Example following.

Example 1.

If 100 Pounds Principal, in 12 Months, gain 5 Pounds Intereſt; what will 246 Pounds Principal gain in 7 Months?

If 100 gain 5 what 246
5

1|00) 12|30
20

1|00) 6|00 *Anſwer* 12 *l.* 6 *s.*

M. *l.* *s.* *M.*
Then ſay again, if 12 gain 12—6 what 7
20

246
7

12) 1722
d.
20) 14,3 6

l. 7,3 6 *Anſwer.*

In the Firſt Stating, the Anſwer is, that if 100 *l*, gain 5 Pounds, the 246 *l.* will gain 12 Pounds 6 Shillings.

Then I ſay in the next Stating; If 12 Months gain 12 *l.* 6 *s.* what will 7 Months gain? And the Anſwer of the Work is, *l.* 7——3——6. And ſo much will 246 Pounds gain in 7 Months, if 100 Pounds gain 5 Pounds in 12 Months.

You muſt particularly note, That in all Operations where the Anſwer to the Queſtion is found by two Rules of Three, the Anſwer of the firſt Stating is ever the middle Number of the ſecond Stating or Work; as in the preceding Examples is plainly ſeen.

The foregoing Queſtion anſwered by a Rule compoſed of the five given Numbers, thus:

```
     (1)          (2)          (3)          (4)          (5)
      l.           M.           l.           l.           M.
  If 100 ———————— 12 ————————— 5 ————————— 246 ———————————— 7
      12                                      5
     ————                                   ————
    1200                                   1230
                                              7
                                ———————————————
                           1200) 8610 (7 l.
                                 8400
                                 ————
                                  210
                                   20
                                ———————————————
                           1200) 4200 (3 s.
                                 3600
                                 ————
                                  600
                                   12
                                ————————————
                           1200) 7200 (6 d.
                                 7200
                                 ————
                                  (0)
```

In this Work, the ſtating the Queſtion, the firſt and fourth Numbers are made of one Name, and the ſecond and fifth; then the two firſt Numbers are multiplied together for a Diviſor, and the laſt three Numbers are multiplied together for a Dividend, and the Quotient or Anſwer is in the ſame Name with the Middle Number, *viz.* Pounds Intereſt, as in the Work I find the firſt Quotient 7 Pounds Intereſt; and ſo I proceed from one Denomination to another, till I find the ſame Anſwer as in the Work at two Statings, *viz.* *l.* 7—3—6.

This Method of Operation ſerves to anſwer all Queſtions in the *Double Rule of Three Direct.*

The Double Rule of Three Reverſe.

IN this Rule you muſt place your Numbers in ſuch Order, that your Second and Fourth Numbers may be of one Name or Denomination, and your Third and Fifth.

Example.

If 100 *l.* Principal, in 12 Months, gain 6 *l.* Intereſt; what Principal will gain 20 *l.* Intereſt in 8 Months?

Stated thus:

	l. P.	*Mo.*	*l. Int.*	*Mo.*	*l. Int.*
	(1)	(2)	(3)	(4)	(5)
If	100	12	6	8	20
	12			6	
	1200			48 the Diviſor.	
	20				

48) 24000 (500 *l. P. Anſwer.*
240
(0)

In this Work, the third and fourth Numbers are multiplied together for a Diviſor; and then the firſt is multiplied by the ſecond, and that Product by the fifth Number, and the Product 24000 is divided by 48, and the Quotient is 500 *l.* Principal; which is what will gain 20 *l.* Intereſt, in 8 Months, and the Anſwer to the Queſtion, as may be ſeen in the Work.

Rules of Practice.

THESE Rules are ſo called from their frequent Uſe and Brevity in caſting up moſt Sorts of Goods in Merchandize.

Note, *That any Queſtion in the Rule of Three, when the firſt Number in ſtating is* 1, *it is moſt briefly done by theſe Rules called* Practice.

But previous to theſe Rules, it is neceſſary to have the following Tables by Heart.

d.	*Parts of a Shilling.*	*Of a Pound.*	s.	d.	*Parts of a Pound.*
6	is $\frac{1}{2}$	$\frac{1}{40}$	10	0	is $\frac{1}{2}$
4	$\frac{1}{3}$	$\frac{1}{60}$	6	8	$\frac{1}{3}$
3	$\frac{1}{4}$	$\frac{1}{80}$	5	0	$\frac{1}{4}$
2	$\frac{1}{6}$	$\frac{1}{120}$	4	0	$\frac{1}{5}$
1 $\frac{1}{2}$	$\frac{1}{8}$		3	4	$\frac{1}{6}$
1	$\frac{1}{12}$		2	6	$\frac{1}{8}$
			2	0	$\frac{1}{10}$
			1	8	$\frac{1}{12}$
			1	0	$\frac{1}{20}$

Parts of a Shilling. *Example* 1.

6 *d.* is ½ 1 *s.* | 426 Pounds of Sugar, at 6 *d.* *per lb.*

2|0) 21|3

l. 10|13 *Anſwer.*

Here 6 *d.* being the Price of each *lb.* and the half of a Shilling; therefore the half of 426 is taken, and gives 213 *s.* or 10 *l.* 13 *s.*

Example 2.

4 *d.* is ⅓ of 1 *s.* | 512 *lb.* of Cheeſe, at 4 *d.* *per lb.*

2|0) 17|0—8 *d.*

l. 8, 10, 8 *Anſwer.*

Here 4 *d.* is ⅓ of a Shilling; therefore the Third Part of 512 is 170 *s.* and ⅔ of a Shilling, or 8 *d.* remains.

Note, *Always what remains is of the ſame Name with the Dividend, which here is Groats, for the Pounds of Cheeſe are at a Groat each.*

Example 3.

3 *d.* is ¼ of 1 *s.* | 246 Yds. of Ribband, at 3 *d.* *per* Yard.

2|0) 6|1—½ of a Shilling, or 6 *d.*

l.—3—1—6 *Anſwer.*

Here the Yards are divided by 4, becauſe 3 *d.* is the 4th of a Shilling; and it quotes 61 Shillings, and 2 remains, or two 3 Pences: So the Anſwer is *l.* 3—1—6.

And thus may any propoſed Queſtion be anſwered, belonging to the firſt Table, or Parts of a Shilling; that is, by dividing the given Number by the Denominator of the Fraction, and the Quotient will be always Shillings, which (the Remainders being known as above) bring into Pounds, by dividing by 20, *&c.*

When the Price of the Integer is at a Farthing, a Half-Penny, or three Farthings more than the Price of Pence mentioned, then for thoſe Farthings take their even Part of the foregoing Quotient taken for the even Part of a Shilling, and add, *&c.*

Examples.

249 Ells of Canvas, at 4 *d.* ½ *per Ell.*

4 *d.* is ⅓ | 83
½ *d.* is ⅛ | 10⅜ or 4 *d.* ½ *Anſwer.*
of 4 *d.* |

2|0) 9|3—4½ *Anſwer.*

4-13-4½

In this Example I divide by 3 for the Groats, as being the Third of one Shilling, and it quotes 83 *s.* then I conſider that a Half-penny is the Eighth of 4 *d.* therefore I take the Eighth Part of the Groat Line, or 83 *s.* and that produces 10 *s.* and ⅜ of a Shilling, or 4 *d.* ½; then the two Lines being added together, make 93 *s.* 4 *d.* ½, or 4 *l.* 13 *s.* 4 *d.* ½, as in the Work.

Parts of a Pound.

10 *s.* is ½ | 254 Yards of Cloth, at 10 *s. per* Yard.

l. 127 *Anſwer.*

Here the Half of 254 is taken, becauſe 10 *s.* is the half of a Pound.

s. *d.*
6—8 ⅓ | 972 Gallons at 6 *s.* 8 *d. per* Gallon.

l. 324 *Anſwer.*

Here the third Part is taken, becauſe 6 *s.* 8 *d.* is the third of a Pound; and the Anſwer is *l.* 324.

And thus may any Queſtion propoſed be anſwered, belonging to the ſecond Table, or Parts of a Pound; that is, by dividing the given Number by the Denominator of the Fraction, and the Quotient will always be Pounds; and if any thing remains, it is always ſo many Halves, Thirds, Fourths, or Fifths, *&c.* of a Pound, according to the Denominator that you divide by.

If the Price be Shillings and Pence, or Shillings, Pence, and Farthings, and no even Part of a Pound; then multiply the given Number by the Shillings in the Price, and take even Parts for the Pence, or Pence and Farthings, and add the ſeveral Lines together, and they will be Shillings; which Shillings bring into Pounds, as before.

Examples.

lb. *s.* *d.*
426 at 4—9
4
1704
6 *d.* $\frac{1}{2}$ | 213
3 *d.* $\frac{1}{4}$ | 106 $\frac{1}{2}$ or 6 *d.*
2|0) 202|3
l. 101-3-6

Ells *s.* *d.*
216 at 2—3 $\frac{1}{2}$
2 *per* Ell.
432
3 *d.* $\frac{1}{4}$ | 54
$\frac{1}{2}$ of 3*d.* $\frac{1}{6}$ | 9
2|0) 49|5 *s.*
24|15 *Anſwer.*

396 Gallons of Brandy, at 7 *s.* 9 *d.* *per* Gallon.
7
2772
6 *d.* $\frac{1}{2}$ 1 *s.* | 198
3 *d.* $\frac{1}{2}$ 6 *d.* | 99
2|0) 306|9
l. 153|9 *Anſwer.*

When the Price is 10 *d.* only annex 0 to the Right of the given Number (which is multiplying by 10) and they are Pence; which divide by 12, and by 20.

Example; 426 *lb.* of Hops at 10 *d. per lb.*

12) 4260
2|0) 35|5
l. 17—15 *Anſwer.*

When the Price is 11 *d.* ſet down the Quantity twice in the form of Multiplication, and add the two Lines together; then divide by 12, and by 20. *Example.*

426 *lb.* of Copper, at 11 *d. per lb.*
426
12) 4686 *Pence.*
2|0) 39|0—6
l. 19,10,6 *Anſwer.*

If the Price be 11 *d.* ½, take half the uppermoſt Line, *&c.*

Example.

942 *lb.* of Tobacco, at 11 *d.* ½ *per lb.*

942
471

12) 10833 *Pence.*

2|0) 90|2 —9*d.*

l. 45—2—9 *d. Anſwer.*

When the Price is 1 *s.* only, divide by 20.

Example.

2|0) 96|4 *lb.* of Tobacco, at 12 *d. per lb.*

l. 48-4 *Anſwer.*

When the Price is 2 *s.* it is done at ſight, by doubling the laſt Figure towards the Right-hand, and ſetting it apart for Shillings; and the Figures towards the left are Pounds.

Example.

596 Gallons of Spirits, at 2 *s. per* Gallon.

l. 59—12 *Anſwer.* Here the Double of 6 is 12*s.* and the 59 are Pounds.

From this Method of Working by 2 *s.* a Multitude of Examples may be moſt expeditiouſly wrought, *viz.*

Ells.
444 Cambrick.
——at 5 *s.* 9 *d.*
44—8 at 2 *s.*
44—8 at 2 *s.*
1 *s.* ½ of 2 *s.* 22—4 at 1 *s.*
6 *d* ½ of 1 *s.* 11—2 at 6 *d.*
3 *d.* ½ of 6 *d.* 5—11 at 3 *d.*

Anſwer, 127—13 at 5—9 *d.*

Yards.
426 at 3 *s.* 6 *d.*
——*per* Yard.
42—12 at 2 *s.*
1 *s.* ½ 2 *s.* 21—6 at 1 *s.*
6 *d.* ½ 1 *s.* 10—13 at 6 *d.*

Anſwer, *l.* 74—11 at 3 *s.* 6 *d.*

The Operation of theſe two Examples is ſo intelligibly wrought, that there is no need of verbal Explanation.

Again, 548 Yards of Broadcloth, at 12 *s.* 6 *d.* *per* Yard.

l. 54, 16 at 2 *s.* 6 times 2 *s.* is 12 *s.*

6*d.* is $\frac{1}{4}$ of 2 *s.* | 328,16 at 12 *s.*
13,14 at 6 *d.*

Note, *That* 13 *l.* 14 *s.* *is the fourth Part of* 54 *l.* 16 *s.* *the two Shilling Line.*

l. 342,10 *Anſwer.*

Or multiply by 12 *s.* and take half of the given Number for the 6 *d.* thus:

548 Yards.
12

6576
$\frac{1}{2}$) 274

2|0)685|0

l. 342—10 *Anſwer.*

When the Price is an even Number of Shillings, multiply the Number of Integers by half the Price, and double the firſt Figure of the Product for Shillings, and carry as is uſual in Multiplication, and the other Figures toward the left will be Pounds.

Example.

296 Yards of Cloth, at 14 *s.* *per* Yard.
7 the half of 14 Shillings.

l. 207—4 *s.* *Anſwer.*

Here 7 times 6 is 42; the Double of 2 *s.* is 4 *s.* *&c.*

When the Price is an odd Number of Shillings, work for the even Number as above; and for the odd Shillings, take the $\frac{1}{20}$ of the given Number, and add them together.

Example.

496 Gallons of Citron Water, at 17 *s.* *per* Gall.
8 the half of 16, or even Part.

l. 396—16 *s.*
24—16

l. 421—12 *Anſwer.*

In this Example I ſay, 8 times 6 is 48; the Double of 8 is 16 *s.* and carry 4; then 8 times 9 is 72, and 4 is 76; 6 and carry 7; and 8 times 4 is 32, and 7 is 39; then the half of 4 is 2, *&c.*

Even Parts of a Pound.

Yards.
10 *s.* is $\frac{1}{2}$ | 426 of Cloth, at 10 *s.* *per* Yard.
213 *Anſwer.*

Nobles *s.* *d.*
429 at 6—8 each.
6—8 *d.* $\frac{1}{3}$ | *l.* 143 *Anſwer.*

lb.
598 of Cocheneal, at 5 *s. per lb.*
5 *s.* is $\frac{1}{4}$ | *l.* 149 $\frac{2}{4}$ or 10 *s.* *Anſwer.*

lb.
154 of Indico, at 4 *s. per lb.*
4 *s.* is $\frac{1}{5}$ | *l.* 30 $\frac{4}{5}$ or 16 *s.* *Anſ.*

3 *s.* 4 *d.* is $\frac{1}{6}$ | 542 *Zeland* Dollars, at 3 *s.* 4 *d.*
90 $\frac{2}{6}$ or 6 *s.* 8 *d.* *Anſwer l.* 90—6—8 *Sterling,*

In all theſe Examples of Practice, I divide by the Denominator of the Fraction, and what remains is always of the ſame Name with the Denominator; as one Half, Thirds, Fourths, Sixths, or Eighths of a Shilling, or of a Pound, *&c.*

If the Price be Half a Crown, divide by 8; if at 20 *d.* or 1 *s.* 8 *d.* divide by 12, *&c.*

When the Price is Shillings and Pence, and no even Part of a Pound; multiply the given Number by the Shillings, and take Parts of it for the Pence, as directed before.

Example.

246 Marks, 13 *s.* 4 *d.*
13
4 *d.* $\frac{1}{3}$ | 738
1 *s.* | 246
82
2|0) 328|0 *s.*
l. 164 *Anſwer.*

For the Groat, I ſay the 3's in 24, 8 times; and the 3's in 6, twice, *&c.*

But this Example may be ſooner done by multiplying the given Number by 2, and dividing that Product by 3, (becauſe a Mark is two Thirds of a Pound) thus:

$$\begin{array}{r} 246 \\ 2 \\ \hline 3)\,492 \\ \hline \end{array}$$

l. 164 *Anſwer* and *Proof.*

I have not here Room to ſpeak of the various and almoſt infinite Methods and Rules of *Practice* (having ſeveral other Subjects and Things to treat on) but ſhall leave ſome general Rules, which if heedfully noted, will be of great Uſe to Learners; and are theſe, *viz.*

1. When the Price is Parts of a Farthing, or of a Penny, as $\frac{3}{4}$, $\frac{5}{6}$, $\frac{7}{8}$, *&c.* then multiply the Integers by the Numerator, and divide by the Denominator, and the Reſult will be either Farthings or Pence; which reduce to Pounds, *&c.*

2. When the Price is Pence, and no even Part of a Shilling; as ſuppoſe 5 *d.* 7 *d.* 8 *d.* or 9 *d.* then it may be done by taking their Parts, as 3 *d.* and 2 *d.* is 5 *d.* and 4 *d.* and 3 *d.* is 7 *d.* and 4 *d.* and 4 *d.* is 8 *d.* and 6 *d* and 3 *d.* is 9 *d.* but it is an eaſy and ſure Way to multiply the given Number by 5, 7, 8, or 9, and then the Product is Pence; which reduce to Pounds by *Reduction.*

3. When the Price is Pence, and Parts of a Penny; as 1 *d.* $\frac{1}{4}$, 2 *d.* $\frac{1}{2}$, or 6 *d.* $\frac{3}{4}$, then work for the Penny by taking the $\frac{1}{12}$; for 2 *d.* the $\frac{1}{6}$; and for 6 *d.* the $\frac{1}{2}$: Then for the Farthings, take $\frac{1}{4}$ of the Penny Line, and for $\frac{1}{2}$, $\frac{1}{4}$ of the Two-penny Line; and for $\frac{3}{4}$, take $\frac{1}{8}$ of the 6 Penny Line; then add their Reſults together, and the Total will be Shillings, which reduce to Pounds, by dividing by 20. Or by the ſure Way of bringing the mixt Number into the loweſt Denomination; as 1 *d.* $\frac{1}{4}$, into 5 Farthings, 2 *d.* $\frac{1}{2}$, into 5 Half-pence, and 6 *d.* $\frac{3}{4}$, into 27 Farthings; then multiply the Integers by 5, and the Product is Farthings; or by 5 Half-pence, and the Product will be Half-pence; or by 27 Farthings, and the Product will be Farthings; which, whether Farthings or Pence, reduce to Pounds, *&c.*

4. When the Price is Shillings and Pence, or Shillings, Pence, and Farthings, multiply the Integers by the Shillings of the Price, and take Parts for the Pence, or Pence and Farthings, *&c.*

5. If the Price be Pounds and Shillings, or Pounds, Shillings, Pence and Farthings; multiply by the Shillings in the Price, that is, in the Pounds and Shillings, and take Parts for the Pence and Farthings.

6. When the Number of Integers hath a Fraction annext, or belonging to them; as $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, *&c.* then take $\frac{1}{4}$, $\frac{1}{2}$, or $\frac{3}{4}$ of the Price of one of the Integers, and add that to the other Reſults.

TARE and TRETT, &c.

Groſs Weight is the Weight of the Goods in Hundreds, Quarters, and Pounds, with the Weight of the Hogſhead, Caſk, Cheſt, Bag, Bale, *&c.* that contains the Goods.

Tare is allowed to the Buyer for the Weight of the Hogſhead, Caſk, Cheſt, Bag, Bale, *&c.*

Trett is an Allowance made for Waſte, Duſt, *&c.* in ſundry Sorts of Goods, as Tobaccoes, Cottons, Pepper, Spices, *&c.* and is always 4 *lb. per* 104 *lb.* Suttle, and ſound by dividing the Suttle Pounds by 26, becauſe 4 times 26 make 104 *lb.* When the Groſs Weight is brought into Pounds, and before the Tare is deducted, they are called *Pounds Groſs*: and after the Tare is ſubtracted, the remaining Pounds are called *Pounds Suttle*; which divided by 26 (as ſaid before) quotes Pounds Trett, *&c.*

Tare at ſo much per Caſk, Hogſhead, Bag, &c.

The Allowances for Tare are variouſly wrought, as by the following Examples.

In 12 Caſks of Indico, containing 45 *C.* 1 *qr.* 14 *lb.* Groſs, Tare 30 *lb per* Caſk, how many Pounds Nett?

12 Caſks
30
——
360 Pounds Tare

C. qr. lb.
45—1—14
45
45
4542
——
5082 Pounds Groſs.
ſubtract 360 Pounds Tare.
——
Anſwer 4722 Pounds Nett.

In this Example, the *lbs.* Tare of one is multiplied by the Number of Caſks, and the Product is 360 Pounds Tare; and the Groſs Weight is reduced into Pounds by the Method ſhewn in Reduction of Weight; and then the Pounds Tare are deducted from the Pounds Groſs, and the Remainder is Pounds Nett, *viz.* 4722, as in the Work.

When the Tare is at ſo much *per C. wt.* multiply the Number of Hundreds by the Tare, and take Parts for the odd Weight, and add it to the Tare found by Multiplication, and divide it by 112 to bring it into Groſs Weight, in order for Subſtraction. *Example.*

What is the Nett Wt. of 12 Caſks of Argol, wt. Groſs,

84 *C.* 2 *qrs.* 14 *lb.*
14 Tare *per C.*
——
336
84
7 for half *C.*
1 ¾ for 14 *lb.*
——
112) 1184 ¾ (10 *C.*
112
——
64 *lb.* or half a *C.* and 8 *lb.*

C. qrs, lb.
84—2—14
10—2— 8 ¾ Tare.
——
74—0—5 ¼ Nett Wt.

The Tare in the laſt Example is to be found by the foregoing Directions, 10 *C.* 2 *qrs.* 8 *lb.* ¾, which ſubtracted as in the Work, leaves 74 *C.* 0 *qrs.* 5 *lb.* ¼ for the Nett Wt.

But the foregoing Example may be ſooner done by *Practice*, thus:

C. qrs. lb.
8)84—2—14 Groſs
——
ſub. 10—2—8 ¾ Tare
——
74—0—5 ¼ Nett

In this Method, the Groſs Weight is divided by 8, becauſe 14 *lb.* is one Eighth of 112 *lb.* and the Remainder is reduced into the next inferior Name, and ſtill divided by 8; to the End, and then deducted as above, and the Nett Weight is the ſame as by the other Way. And ſo may any Tare *per Cent.* be found, if the Tare be an even Part of 112 *lb.* as 14 is one Eighth, and 7 *lb.* is the half of that, and 16 *lb.* is one Seventh, and 8 *lb.* is the half of that, *&c.* that is, if the Tare be at 7 *lb. per C.* find it for 14 *lb.* as before, and then take the Half of that for 7 *lb. per C.*

Tare, the like for 8 *lb. per C.* Tare; take one Seventh for 16 *lb.* and then the half of that for 8 *lb. per C.* Tare.

Of TRETT.

What *Trett* is, when allowed, and how found, hath been ſaid already; now I ſhall give an Example for Explanation as follows.

Bought Six Hogſheads of Tobacco, containing Groſs and Tare as follows; *viz.*

No.		*C. qrs. lb.*		*lb.*
1	qt.	4—1—20	Tare	80
2		5—2—19		100
3		6—3—18		102
4		7—3—12		104
5		8—2—13		106
6		9—1—14		110
		42—3—12		602

26) 4198 (161 *lb.* Trett
26 · ·
159
156
38
26
12

42
42
42|96
4800 Pounds Groſs.
ſubtract 602 Pounds Tare.
4198 Pounds Suttle.
deduct 161 $\frac{6}{13}$ Pounds Trett.
4036 $\frac{7}{13}$ Pounds Nett.

There are ſome few other Rules, ſuch as Barter, or exchanging Goods for Goods; alſo Exchange for Coin, Profit, Loſs, *&c.* but all of them being done either by the Rule of Three, or by Rules of Practice, it is therefore here unneceſſary to enlarge upon them.

Of FRACTIONS *Vulgar and Decimal.*

WHAT *Fractions* are, hath already been hinted in the Rule of *Diviſion*, from whence they ariſe; for the Remainder is a ſuppoſed Part of the Diviſor; as admit 54 *l.* is divided into twelve equal Parts, the Quotient is 4, and the Remainder 6: So that here 6 is ſix Parts of 12, or ſix Twelfths, equal to a half: for 6 is the $\frac{1}{2}$ of 12; and ſet down in this Form $\frac{6}{12}$, and underſtood by theſe Names, *viz.*

6

6 *Numerator.*

——

12 *Denominator.*

The *Numerator* is above the ſhort Line, and ſheweth the Number of Parts; and the *Denominator* ſtands under the Line, and declares the Number of equal Parts the Integer or whole Number is divided into; as above 54 *l.* is divided into 12 Parts, and the Quotients ſay there are 4 of thoſe 12 Parts contained in 54, and 6 remains, or 6 Twelfths of a Pound, or 10 *s.* as above-ſaid.

Fractions are thus ſet down and read, *viz* $\frac{1}{4}$, one Fourth; $\frac{1}{2}$, one Half; $\frac{1}{3}$, one Third; $\frac{1}{5}$, one Fifth; $\frac{1}{6}$, one Sixth; $\frac{2}{3}$, two Thirds; $\frac{2}{4}$, two Fourths; $\frac{2}{6}$, two Sixths; $\frac{5}{7}$, five Sevenths, *&c.*

Fractions are either proper or improper; A proper Fraction hath its Numerator leſs than the Denominator; as $\frac{5}{8}$ five Eighths; $\frac{24}{56}$, twenty-four Fifty-ſixths, *&c.*

An improper Fraction hath its Numerator greater than the Denominator; as $\frac{7}{3}$, ſeven Thirds; $\frac{48}{15}$ forty-eight Fifteenths, *&c.*

Again, Fractions are either Simple or Compound; ſimple, when Part of an Integer or Thing hath but one Numerator, and one Denominator; as $\frac{3}{4}$ of a Pound Sterling, $\frac{1}{2}$ of a C. Weight, $\frac{2}{3}$ of a Tun, $\frac{5}{6}$ of a Gallon, *&c.* Compound, is a Fraction of a Fraction, as the $\frac{1}{2}$ of a $\frac{1}{4}$ of a Pound Sterling is equal to Half a Crown; or when one is divided into any Number of Parts, and thoſe Parts again ſubdivided into Parts, *&c.*

Fractions are of two kinds, *viz. Vulgar* and *Decimal. Vulgar* Fractions are as declared before. *Decimal* Fractions are artificially expreſſed by ſetting down the Numerators only, the Denominators being underſtood; and are always a Unit, with as many Cyphers annex'd as there are Places in the Numerator; and therefore muſt be either 10, or ſome Power of 10, as 100, 1000, 10000, or 100000, *&c.*

Decimal Fractions appear as whole Numbers, (and in the general ſo wrought) but are diſtinguiſhed from them by a Point or Comma prefixed, thus ,5 is read five Tenths; ,32 thirty-two Hundredths; and ,256 two Hundred 56 Thouſandths: But of *Decimal* Fractions and their Uſe hereafter.

Reduction of Vulgar Fractions, is to fit or prepare them for *Addition, Subtraction.* &c.

1. *To reduce a mixt Number to an improper Fraction.*

Rule.

Multiply the Integer by the Denominator, and take in the Numerator.

Example.

Reduce 12 Gallons $\frac{3}{4}$ to an improper Fraction, thus,

4

—

51

—

4 *Anſwer* 51 Fourths, or 51 Quarts.

2. *To reduce an improper Fraction to a whole or mixt Number.*

Rule. Divide the Numerator by the Denominator.

Example.

Reduce the laſt Example to a whole or mixt Number, *viz.*

$$\frac{51}{4} \qquad 4)\,51$$

12

—

3 Remainder.
4 Diviſor.

Here 12 Gallons is the whole Number, and $\frac{3}{4}$ the Fraction, the ſame with 3 Quarts.

3. *To reduce Fractions to a common Denominator.*

Rule.

Muliply the Numerator of each Fraction into all the Denominators, except its own, and the Product will be a Numerator to that Fraction; and then do ſo by the next, &c.

Example.

Reduce $\frac{2}{3}$, $\frac{3}{4}$, and $\frac{5}{6}$ of 20 *s.* or any other Integer, or Thing to a common Denominator; ſay, twice 4 is 8, and 6 times 8 is 48, for a new Numerator to $\frac{2}{3}$; then ſay 3 times 3 is 9, and 6 times 9 is 54, for a new Numerator to $\frac{3}{4}$; laſtly, ſay, 5 times 4 is 20, and 3 times 20 is 60, the Numerator to $\frac{5}{6}$: Then, to find the common Denominator, ſay 3 times 4 is 12, and 6 times 12 is 72, the common Denominator: So that $\frac{48}{72}$ is equal to $\frac{2}{3}$, $\frac{54}{72}$ to $\frac{3}{4}$, and $\frac{60}{72}$ to $\frac{5}{6}$. And thus proved:

$\frac{2}{3}$

of a Pound is	13	4	48	Added together made 162.
ditto	15	0	54	
ditto	16	8	60	
	45	0	$\frac{162}{72}$	Common Denominator.

Here the ſeveral Numerators are added together, and they ake 162; which placed over the common Denominator 2, make the Improper Fraction $\frac{162}{72}$; and its Value is ound as before directed, *To reduce an improper Fraction to a hole or mixt Number*; as may be ſeen in the foregoing age.

4. *To reduce a Fraction into its loweſt Terms.*

Rule.

If there are even Numbers, take half of the Numerator, nd Denominator, as long as you can; and then divide them y any digit Number (*i. e.* 3, 4, 5, 6, *&c.*) that will leave o Remainder in either.

Example.

Reduce $\frac{56}{84}$ into its loweſt Terms; ſay the $\frac{1}{2}$ of 56 is 28, nd the $\frac{1}{2}$ of 84 is 42; and then, the $\frac{1}{2}$ of 28 is 14, and the $\frac{1}{2}$ of 42 is 21: So the Fraction $\frac{56}{84}$, is reduced to $\frac{14}{21}$. And ince they both are not to be halved any longer; for though you can halve 14, yet you cannot 21, without Remainder; ry therefore to divide them by ſome other digit Number, nd you will find, that 7 will divide both Numerator and Denominator without any Remainder; then ſay, the 7's in 14, twice; and the 7's in 21, three times: So is the Fraction $\frac{56}{84}$ reduced into its loweſt Terms, $\frac{2}{3}$ two Thirds; nd is the ſame in Value with $\frac{56}{84}$, and done in this Form:

$$\begin{array}{c|c|c|c} \overset{2}{56} & \overset{2}{28} & \overset{7}{14} & 2 \\ \hline 84 & 42 & 21 & 3 \end{array}$$

And the Certainty that $\frac{2}{3}$ is the ſame in Value with $\frac{56}{84}$ is found by multiplying any Integer by the Numerator of each Fraction, and dividing by the Denominator of each Fraction.

Example.

Let the Integer be 1 *l.* Sterling, or 20 *s.*

The beſt Way.	*The common Way.*
s.	*s.*
20	20
2	56
3)40	84)1120(13 *s*
	84
13—4 *d.*	
	280
	252
	28
	12
	336(4 *d.*
	336
	(0)

13 *s.* 4 *d.*

Here it is manifeſt, that by working by a Fraction in it loweſt Terms, much Time and Figures are ſaved. In on Operation, 20, the Integer is multiplied by 2, and the Product 40 divided by 3, and there remains 1, or $\frac{1}{3}$ of a Shilling, or a Groat, as in the other Work.

There are other Methods of reducing a Fraction into it loweſt Terms; but in my Opinion, none ſo ready as the foregoing.

5. *To reduce a Compound Fraction into a Simple one of the ſame Value.*

Rule. Multiply the Numerators together for a Numerator and the Denominators together for a Denominator.

Example.

Reduce $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{5}{6}$ of a Pound Sterling into a ſimpl Fraction. Say twice 3 is 6, and 5 times 6 is 30, the Numerator: then 3 times 4 is 12; and 6 times 12 is 72, th Denominator: So $\frac{30}{72}$ of a Pound is equivalent to $\frac{2}{3}$ of of $\frac{5}{6}$ of a *l.* Thus proved, $\frac{5}{6}$ of a *l* is 16 *s.* 8 *d.* and $\frac{3}{4}$ o ditto, or 16 *s.* 8 *d.* is 12 *s.* 6 *d.* and $\frac{2}{3}$ of 12 *s.* 6 *d.* is 8 *s* 4 *d.* the Anſwer: And multiplying 20 by 30, and dividin by 72, gives the ſame Anſwer, as in the following Work i plain.

2

20
30
——
72)600 (8 *s.*
576
——
24 Remains
12 Multiply
——
72) 288 (4 *d.*
288
——
(0)

} 8 *s.* 4 *d.*

6. *To find the Value of any Fraction, whether of Coin, Weight, or Meaſure.*

Rule. Multiply the Integer by the Numerator, and divide by the Denominator; and if any thing remains, multiply it by the Number of Units of the next inferior Denomination.

Example.

What is $\frac{30}{72}$ of a Pound, or 20 *s.*? the foregoing Example of Proof to the Compound Fraction $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{5}{6}$, and as it is worked there, it need not again be repeated.

Again, What is $\frac{5}{6}$ of a Tun Weight?

C.
20 the Integer.
5 the Numerator.
——
The Denominator 6) 100
C. 16—4 remains.
4 *qrs.* 1 C.
——
6) 16
——
qrs. 2—4 remains,
28 *lb.* 1 *qr.*
——
6) 112
——
lb. 18—$\frac{4}{6}$

Anſwer,
16 C. 2 *qrs.* 18 *lb.* $\frac{4}{6}$

Here the Integer 20 C. is multiplied by the Numerator 5, and the Product 100 divided by the Denominator 6, and the Remainder 4 is multiplied by the Parts of the next inferior Denomination, &c. and the Anſwer is 16 *C.* 2 *qrs.* 18 *lb.* $\frac{4}{6}$, or $\frac{2}{3}$ of a Pound Weight, as in the Work.

Addition of Vulgar Fractions.

IF the Fractions to be added have a common Denominator, add the Numerators together for a Numerator, and place it over the common Denominator.

Example.

Add $\frac{2}{5}$, $\frac{3}{5}$, and $\frac{4}{5}$ of a Pound Sterling together. Say, 2 and 3 is 5, and 4 is 9, the Numerator; which place over 5, the common Denominator, thus, $\frac{9}{5}$; and this improper Fraction $\frac{9}{5}$, is in Value 36 *s.* for 9 times 4 *s.* (the 5th of a Pound) is 36 *s*, thus: Here $\frac{4}{5}$ is 16 *s.* I ſay the 5's in 9 once, and 4 remains, which is $\frac{4}{5}$ of a Pound.

$$\begin{array}{r} 5)\ 9 \\ \hline l.\ 1\ \frac{4}{5} \end{array}$$

But if the Fractions to be added have unequal Denominators, then they muſt be reduced to a common Denominator, by the Rule before ſhewn, before Addition can be made; and then proceed as above.

2. When mixt Numbers are to be added, work with the fractional Parts as before, and carry the fractional Value to the whole Numbers.

Example.

Add 25 *l.* $\frac{3}{4}$ to 12 $\frac{1}{4}$, thus:

$$\begin{array}{rr} & 25\ \frac{3}{4} \\ & 12\ \frac{1}{4} \\ \hline l. & 38\ \textit{Anſwer.} \end{array}$$

Here 1 and 3, the Numerators, make 4; and $\frac{4}{4}$ is 1; and 2 is 3, and 5 makes 8; and 1 and 2 is 3, and the Anſwer is 38.

Or they may be reduced to improper Fractions thus:

$$\begin{array}{ccc} 25\ \frac{3}{4} & 12\ \frac{1}{4} & 103 \\ 4 & 4 & 49 \\ \hline 103 & 49 & 4)\ 152 \\ \hline 4 & 4 & 38\ \text{Pounds.} \end{array}$$

Here the Numerators are added, and their Total is 152; which divided by 4, the common Denominator, quotes 38 Pounds, the ſame Anſwer as above.

3. When compound Fractions are to be added to Simple ones, reduce the Compound Fraction to a Simple one, as before directed; and then proceed as above.

Example.

Add $\frac{2}{8}$ and $\frac{3}{8}$ to $\frac{1}{2}$ of $\frac{2}{4}$ of a Pound; thus, once 2 is 2, and twice 4 is 8, the Compound Fraction: Then add, ſaying 2 and 3 is 5, and 2 is $\frac{7}{8}$, equal in Value to 17 *s.* 6 *d.*

Subtraction of Vulgar Fractions.

IN this Rule, the Fractions muſt have a common Denominator, or be reduced to one, before Deduction can be made.

Example.

What is the Difference between $\frac{1}{4}$ and $\frac{3}{4}$? Anſwer $\frac{2}{4}$; and proved by Addition: For $\frac{1}{4}$ and $\frac{2}{4}$ makes $\frac{3}{4}$ or 3 quarters.

Note, The Difference between the Numerators is the Difference of the Fractions.

Again, from $\frac{3}{4}$ of a Pound, take $\frac{5}{12}$: Here the Fractions are to be reduced to a common Denominator: 36 the firſt Numerator, and 20 the ſecond Numerator, and their Difference is 16; and 48 is the common Denominator: So that $\frac{16}{48}$, or $\frac{1}{3}$, in its loweſt Terms, is the Difference between $\frac{3}{4}$ of a Pound, and $\frac{5}{12}$ of a Pound; that is, 6 *s.* 8 *d.*

To ſubtract a Compound Fraction from a Simple one.

Rule. Reduce the Compound Fraction to a Simple one, and then work as before. *Example.*

From $\frac{13}{14}$ take $\frac{2}{3}$ of $\frac{8}{9}$; ſay twice 8 is 16, and 3 times 9 is $\frac{16}{27}$, the Compound Fraction. Then $\frac{13}{14}$ nnd $\frac{16}{27}$ muſt be reduced to a common Denominator, thus; 13 times 27 is 351, the firſt Numerator; 16 times 14 is 224, the ſecond Numerator; and 14 times 27 is 378, the common Denominator. Then ſubtract 224 the ſecond Numerator, from 351 the firſt Numerator, and the Remainder is 127, which place over 378 the Common Denominator, thus, $\frac{127}{378}$ *Anſwer.*

When a Simple Fraction is to be deducted from a Whole Number.

Rule. Subtract the Numerator of the Fraction from the Denominator, and place the Remainder over the Denominator, and carry 1 to ſubtract from the whole Number, *&c.*

Example.

From 12 *l.* take $\frac{5}{8}$ thus, ſay 5 (the Numerator) from 8 (the Denominator) and there remains 3, which place over the Denominator 8, thus $\frac{3}{8}$; then 1 from 12 and there remains 11: So the Anſwer is, *l.* 11 $\frac{3}{8}$, 11—7—6, as may be proved by whole Numbers.

Multiplication of Vulgar Fractions.

Rule. MUltiply the Numerators into one another for a Numerator of the Product; and then do the ſame by the Denominators, for a Denominator of the Product.

Example.

Multiply $\frac{3}{4}$ of a Pound, by $\frac{5}{6}$ of ditto; ſay 3 times 5 is 15, the Numerator; and 4 times 6 is 24, the Denominator: So the Anſwer is $\frac{15}{24}$, or in its loweſt Terms $\frac{5}{8}$.

You are to note, That Multiplication in Fractions leſſens the Product, tho' in whole Numbers it augments it; as above, $\frac{5}{8}$ or 12 *s.* 6 *d.* is leſs than $\frac{5}{6}$ or 16 *s.* 8 *d.* and alſo leſs than the other Fraction $\frac{3}{4}$ to 15 *s.* The Reaſon of which I have not here Room to inſiſt on; but it is given in my *Arithmetic in Multiplication of Vulgar Fractions*; to which Book I refer the Reader for that, and ſundry Enlargements in the ſeveral Rules in the Science of *Arithmetic.*

2. *To multiply a Whole Number by a Fraction.*

Rule. Multiply the Integer by the Numerator of the Fraction, and place the Product over the Denominator.

Example.

Multiply 56 *l.* by $\frac{3}{4}$.

$$\begin{array}{r} 56 \\ 3 \\ \hline \frac{168}{4} \end{array} \Bigg\} \textit{Facit.}$$

This improper Fraction $\frac{168}{4}$ reduced according to Rule, makes but 42 *l.* which is leſs than 56; and confirms what was before aſſerted, *viz.* that Multiplication of Fractions leſſens the Product, *&c.*

3. *To multiply a Simple by a Compound Fraction.*

Rule. Reduce the Compound Fraction to a Simple one, as before taught, and work as above.

Example.

Multiply $\frac{6}{8}$ of a Pound, by $\frac{2}{3}$ of $\frac{3}{4}$ of a Pound: Say 6 times 6 is 36, and 8 times 12 is 96. So that the Anſwer is $\frac{36}{96}$, or $\frac{3}{8}$ in its loweſt Terms; equal to 7 *s.* 6 *d.*

Diviſion of Vulgar Fractions.

Rule. MUltiply the Numerator of the Diviſor into the Denominator of the Dividend, and the Product is the Denominator of the Quotient; and then multiply the Denominator of the Diviſor into the Numerator of the Dividend, and the Product will be the Numerator of the Quotient.

Example.

Divide $\frac{15}{16}$ by $\frac{2}{3}$) $\frac{15}{16}$ ($\frac{45}{32}$ Quotient.

Here 16 multiplied by 2, gives 32; and 15 by 3, gives 45: So that the Quotient is $\frac{45}{32}$, equal to 1 $\frac{13}{32}$, as in the Work.

Again, Suppoſe $\frac{24}{36}$, was divided by $\frac{2}{3}$ the Quotient will be $\frac{72}{72}$, equal to 1 Integer, or whole Thing. And ſo any other Example.

Reduction of Decimal Fractions.

WHAT a *Decimal Fraction* is, hath been already ſhewn. The next Step is, how to reduce a Vulgar Fraction into a Decimal: Which is no more than to annex Cyphers at Diſcretion (that is 2, 3, or 4, *&c.*) to the Numerator, and then divide it by the Denominator.

Example. 1.

Reduce $\frac{3}{4}$ of a Pound Sterling to a Decimal:

$$\left.\begin{array}{r} 4)\ 300 \\ \hline ,75 \end{array}\right\}$$

that is, 75 Hundredths, equal to 3 qrs. of any thing, whether Money, Weight, Meaſure, *&c.* as being $\frac{3}{4}$ of 100; and ſo, 25 Hundredths is, in Decimals, the Quarter of any thing, as being $\frac{1}{4}$ of 100; and five Tenths expreſſes the half of any thing, as being the $\frac{1}{2}$ of 10.

In Reduction of Decimals, ſometimes it happens that a Cypher or Cyphers muſt be placed to the Left-hand of the Decimal to ſupply the Defect or Want of Places in the Quotient of Diviſion, or in the Product of Multiplication of Decimals.——In this Caſe always remember, That ſo many Cyphers as you annex to the Denominator of the Vulgar Fraction, ſo many Places you muſt point off in the Quotient towards the Left-hand; but if there be not ſo many Places to point off, then you muſt ſupply the Defect by placing 0 to the left of the Decimal.

Example 2.

Reduce 9 *d.* or $\frac{9}{240}$ to the Decimal of a Pound Sterling, thus:

24) 0,9000,0 (,0375
72··
———
180
168
———
120
120
———
(0)

Here is but three Places in the Quotient, *viz.* 375; and therefore I cannot point off 4 for the four Cyphers annexed to 9; wherefore I prefix 0 to the Left of the Quotient 375, thus ,0375, and then it is the Decimal of 375 ten thouſand Parts of an Integer in the Work.

The more Cyphers you annex, the nearer you bring your Decimal to the Truth: But in moſt Caſes, four Cyphers annexed is ſufficient. But when you are to reduce $\frac{1}{4}$, $\frac{1}{2}$, or $\frac{3}{4}$ (as above) of an Integer to a Decimal, or any Number of Shillings to a Decimal of a Pound, two Cyphers are ſufficient. One Example more.

Example 3.

Reduce 3 Farthings to the Decimal of a Pound, that is, $\frac{3}{960}$ vulgarly, 960 Farthings being a Pound, and therefore ſo expreſs'd, and with the ſame Reaſon as 9 Pence before, 240 Pence being a Pound.

96|0) 30000|0 (,003125. The Work being performed according to the Diviſion, with two Cyphers prefixed, quotes, ,003125, or 3125 Hundred Thouſandth Parts of a Pound————By the ſame Method, the Vulgar Fractions of Weight, Meaſure, *&c.* are reduced to Decimals.

Example 4.

How is 12 Pounds Weight expreſſed in the Decimal of 1 C. Weight *Avoirdupois*, or 112 *lb.* the Vulgar Fraction is $\frac{12}{112}$, and the Decimal, 1071 found as before, thus,

112) 120000 (,1071
112
——
&c.

The Remainder 48 is not worth Notice, being leſs than the 10000th Part of an Unit, or 1.

Example 5.

How is 73 Days brought to the Decimal of a Year? vulgarly thus expreſſed $\frac{73}{365}$.

365) 730 (,2 *Anſ.* 2 tenths.
730
———
(0)

Thus proved
36,5
36,5
——
73

Here 365, the Days in a Year, is divided by 10, twice; and the Quotients added together, and they make 73 Days.

Va-

Valuation of Decimals.

TO find the Value of a Decimal Fraction, whether of Coin, Weight, Meaſure, *&c.*

Rule. Multiply the Decimal given by the Units contained in one of the next inferior Denomination, and point off as many Places from the Right-hand as you have in your Decimal; ſo thoſe Figures toward the Left of thoſe pointed off, are Integers, or Whole Numbers; and thoſe on the other Side toward the Right-hand, are Parts of 1 or Unity; that is, ſo many Tenths, Hundredths, Thouſandths, or Ten Thouſandths of one of thoſe Integers, whether a Pound, a Shilling, or a Penny, *&c.* or of a Tun, a Hundred, a Quarter, or a Pound Weight, *&c.* And ſo of any other Integer, of what Kind or Quality ſoever.

Examples.

,476 Parts of a Pound Sterling.
20 Shillings a Pound.

9,520
12 Pence 1 Shilling,

Anſwer. 6,240
9 *s.* 6 *d.* 960 4 Farthings 1 Penny.
Parts or $\frac{1}{4}$
of 1 *d.* ,960 Parts of 1 *l.* or almoſt $\frac{1}{4}$ of 1 *d.*

,476 Parts of a Tun wt.
20 C. 1 Tun.

9,520
4 *qrs.* 1 C.

2,080
Anſwer. 28 *l.* 1 *qr.* of a C.
9 C. 2 *qrs.* 2 *lb.* 240 *parts.*
2,240

In the Example of Money, I multiply the Fraction by 20, and point off 520 for the three Places in the Decimal, *&c.* and the Anſwer is 9 *s.* 6 *d* $\frac{1}{4}$.

In the Example of Weight, I proceed as in that of Money (the Fraction being the ſame) but with different Reſpect to the inferior Denominations; and the Anſwer is 9 C. 2 *qrs.* 2 *lb.* $\frac{240}{1000}$ of a Pound Wt.

To find the Value of a Decimal in Money in a briefer Method, *viz.*

Rule. Always account the double of the firſt Figure (to the Left-hand) for Shillings; and if the next to it is 5, reckon; and whatever is above 5, call every One, Ten; and the next Figure ſo many Ones as it contains; which Tens and Ones call Farthings; and for every 25, abate One: As admit the laſt Example of Money, *viz.* 476; the double of 4 is 8; and there being one 5 in 7, (the next Figure) I reckon 1 *s.* more, which makes 9 *s.* and there being 2 in 7 above 5, they are to be accounted two Tens, or 20; which with the next Figure 6 being ſo many Ones, make 26 Farthings; and abating 1 for 24, give 6 *d.* and almoſt a Farthing more, for the Fraction 960 Thouſandths of a Pound is within 40 of a Farthing.

Addition of Decimals

IS the ſame in Practice as in the whole Numbers; only in ſetting down, Care muſt be taken that the Decimal Parts ſtand reſpectively under their Parts; that is, Primes under Primes, Seconds under Seconds, Thirds under Thirds, *&c.* and the Integers ſtand as in whole Numbers.

Example.

Integers			Primes	Seconds	Thirds
2	4	6	,4	2	6
	7	4	,4	2	
		9	,0	6	
	6	5	,7	9	4
	4	2	,0	0	5
4	3	7	,7	0	5

	Parts			
	,4	7	9	6
	,4	2		
	,0	7	6	
	,0	0	0	4
	,5			
1	,4	7	6	0

	Primes	Seconds	Thirds	Fourths	Fifths
	,4	7	9	6	2
	,0	6	4	2	
	,0	0	6		
	,7				
	,9				
2	,1	4	9	8	2

Note, *There muſt be as many Places pointed off, as there are in the biggeſt Number.*

The caſting up of the foregoing Examples is the ſame with Addition of one Denomination in Whole Numbers: The Total of the firſt (ſuppoſing them Pounds Sterling) is 437 *l.* and ,705 Parts. The ſecond is 1 *l.* and ,4760 Parts. And the third is 2 *l.* and ,14982 Parts.

Subtraction of Decimals.

THE Numbers muſt be placed as before in *Addition*, and then proceed as in *Subtraction of one Denomination of Numbers.*

Examples.

l. pts.	*l. pts.*	*l. pts.*
46,51	140,42	4762,0
9,24	91,7462	0,472
37,27	48,6738	4761,528

Multiplication of Decimals.

HERE the placing the Numbers and Operation is the very ſame as in the Whole Numbers; and only to remember to point off towards the Right-hand ſo many Places for Decimals as you have Decimal Places in both *Multiplicand* and *Multiplier*.

Examples.

(1)	(2)	(3)
24,6	4602	,2796
2,5	,075	26
1230	23010	16776
492	32214	5592
61,50	345,150	7,2696

(4)	(5)	(6)
,07214	,083	4,25
,006	,16	1,09
,00043284	498	3825
	083	4250
	,01328	4,6325

Note, That where there are not a competent Number of Figures, or Places to point off, ſuch Defect is ſupplied with Cyphers to the Left-hand; as in the 4th and 5th Examples, according to what was before hinted in reducing a Vulgar Fraction to a Decimal.

Diviſion of Decimals

IS the ſame in Operation as in whole Numbers: The only Difficulty is to know how many Decimal Places to point off towards the Left-hand of the Quotient: to which end, remember this Rule: Obſerve how many Decimal Places there are, both in the Diviſor and Dividend, and note the Difference; and whatſoever it is, ſo many Places muſt be pointed off to the Right-hand of the Quotient.

Examples.

Divide 12,345670 by 6,789)

```
12,345670 (1,818
 6789 · · ·
 ---------
  55566
  54312
  -----
   12547
    6789
   -----
    57580
     54312
    ------
    (3268)
```

In this Example, the Dividend hath three Decimal Places more than the Diviſor, wherefore I point off three Places to the Right-hand of the Quotient, *viz.* 818; ſo the Quotient is 1 Integer, and ,818 Parts.

Divide 3,46000 by 1,23)

```
3,46000 (2,813
246 · · ·
-----
1000
 984
 ----
  160
  123
  ----
   370
   369
   ---
   (1)
```

Here the Difference between the Diviſor and Dividend is three Places; as in the foregoing Example; therefore ,813 is pointed off for the Decimal Fraction; and the Quotient is 2 Integers, and ,813 thouſandths of an Integer, or 1

Thus much for Fractions Vulgar and Decimal; wherein I have been as conciſe as poſſible, and worked with as much Plainneſs as I could invent.

BOOK-KEEPING.

THE next Qualification to fit a Man for Buſineſs, after *Arithmetick*, is the Art of *Book-keeping*, or *Merchants-Accompts*, after the *Italian* Manner, by way of Double Entry.

It is not without good Reaſon that moſt People of Buſineſs and Ingenuity, are deſirous to be Maſters of this Art: For if we conſider the Satisfaction that naturally ariſeth from an Accompt well kept; the Pleaſure that accrues to a Perſon by ſeeing what he gains by each Species of Goods he deals in, and his whole Profit by a Year's Trade; and thereby alſo, to know the true State of his Affairs and Circumſtances; ſo that he may, according to Diſcretion, retrench or enlarge his Expences, &c. as he ſhall think fit.

This Art of *Book-keeping*, or *Merchants-Accompts*, is talked of by many, but truly underſtood but by very few: For every petty School-Maſter in any By-Corner, will be ſure to have *Merchants-Accompts* expreſſed on his Sign, as a principal Article of his Ability in Teaching; though, ſtrictly ſpeaking, for want of the Practical Part, knows hardly any Thing of the Matter, and conſequently uncapable of teaching it.

Inſtructions, Notes, Rules, and Directions for the right ordering and keeping *Merchants-Accompts* by the excellent Order of Charge and Diſcharge, commonly called *Debtor and Creditor*.

Of the Books in Uſe.

THE Books of principal Uſe, are the *Waſte-Book*, (or by ſome called the *Memorial*) *Journal*, and *Leidger*.

Waſte-Book.

IN this Book muſt be daily written whatever occurs in the Way of Trade; as Buying, Selling, Receiving, Delivering, Bargaining, Shipping, &c. without Omiſſion of any one thing, either bought or ſold, &c. as Money lent, or received at Intereſt: But not Money received or paid for Goods ſold or bought at Times; for that will come of courſe, and muſt be entered into the *Caſh-Book*, from whence it is poſted into the *Leidger*.

The *Waſte-Book* is ruled with one Marginal Line, and three Lines for Pounds, Shillings, and Pence, and the

Day of the Month, and Year of our Lord, is inſerted in the Middle of the Page. In this Book any one may write, and, on occaſion, any thing may be blotted out, if not well entered, or any Error be made.

JOURNAL.

INTO this Book every thing is poſted out of the *Waſte-Book*, but in other Terms, in a better Stile, and in a fairer Hand, without any Alteration of Cyphers or Figures; and every Parcel, one after another (promiſcuouſly ſet) without Intermiſſion, to make the Book, or ſeveral Entries of it, of more Credit and Validity, in Caſe of any Law Diſpute, or any other Controverſy that may happen between Merchant and Merchant. In this Book you are to diſtinguiſh the Debtor and Creditor (or in quainter Terms, the *Debit* and *Credit.*) And to this Book you muſt have Recourſe for the Particulars of an Accompt, which in the Leidger are enter'd in Groſs, that is, in one Line. In this Book alſo, the Day of the Month muſt be placed in the Middle of the Page; and is ruled with double Marginal Lines, for References to the Leidger; and with three Lines for *l. s. d.* as the Waſte-Book.

Of the Leidger.

FROM the *Journal* or *Day-Book* (as derived from the *French*) all Matters or Things are poſted into the *Leidger*, which by the *Spaniards* is called *el Libro Grande*, as being the biggeſt Book, or chief of Accompts. The Left-hand Side of this Book is the *Debtor*, and the Right the *Creditor*; and the *Numbers* and *Folios* of each Side muſt be alike, as 45 *Debtor*, and alſo 45 *Creditor*. The Day of the Month (in this Book) by moſt is ſet in a narrow Column on the Left-hand, and the Month on the Left of that: But where I kept Books, the Number in the narrow Column referr'd to the Journal Page, and the Month and Day was placed in the broad Column, to the Right of that; and at the Head of each Folio is the Name of the Place of Reſidence, and the Year of our Lord; as thus:

London, Anno——————————1750.

But the Examples of theſe ſeveral Books hereafter following, will make the foregoing Hints of them much more intelligible.—And as I am upon the Doctrine of Book-keeping, I'll take this as an univerſal Text (for ſo it is) *viz.*

All Things received, or the Receiver, are Debtors to the Delivered, or the Deliverer.

		l.	*s.*	*d.*
	Waſte-Book Entry. *London, January* 1, 1750. Bought of *William Wilkins*, of *Norton-Falgate*, 120 Yards of white Sarcenet, at 2 *s.* 3 *d. per* Yard, to pay in 2 Months ——— ———	13	10	—
1 — 2	*The Journal Entry of the ſame.* Wrought Silk, Debtor of *William Wilkins, l.* 13—10 for 120 Yards of white Sarcenet, at 2 *s.* 3 *d. per* Yard, to pay in 2 Months ——— ——	13	10	—
	In this Example, the Accompt of Wrought Silks is the Receiver, and therefore Debtor to William Wilkins *the Deliverer.*			
	Again, *Waſte-Entry Book.* *January* 4. Sold *Henry Harrington* 246 lb. nett of Indico Lahore, at 6 *s.* 6 *d. per* lb. to pay in 3 Months ———	79	19	—
3 — 4	*Journal Entry.* *Henry Harrington* Dr to Indico, for 246 lb. nett, at 6 *s.* 6 *d. per* lb. to pay in 3 Months —— ——	79	19	—
	Once more *Waſte-Book Entry.* Bought of *George Goodinch*, Sen. *viz.* *Cheſh.* Cheeſe 430 C. $\frac{1}{2}$, at 23 *s.* 4 *d. per* C. ——— } *l* 502—5 Butter, 50 Firkins, qt. nett, 2800 lb. at 3 *d. per* lb. } 35—0 to pay at 6 Months ———	537	05	—
— 5 4 5 —	*Journal Entry.* Sundry Accounts. Dr. to *Geo. Goodinch*, *l.* 537—05 ——viz.. Cheeſe of *Cheſhire*, for 430 C. $\frac{1}{2}$, 23 *s.* 4 *d*, *per* C. } *l.* 502—5 Butter, for 50 Firkins, qt. nett 2800 lb. at 3 *d. per* lb. } 35—0	537	05	—

Waſte-Book.		*l.*	*s.*	*d.*
Sold *James Jenkins*, viz.				
White Sarcenet 50 Yards at 3 *s. per* Yard	7—10—0			
Indico Lahore 50 Pounds at 7 *s. per* Pound	17—10—0			
		25	—	—

	Journal Entry of the laſt.				
6 —	*James Jenkins* Debtor to ſundry Accounts, *viz.*				
7	To white Sarcenet for 50 Yards, at 3 *s. per* Yard	*l.* 7—10—0			
8	To Indico Lahore for 50 *lb.* at 7 *s. per lb.*	17—10—0			
			[illegible]	—	—

From theſe few Examples of Entry, it may be obſerved, that an experienced Perſon in Accompts, and a good Writer, may keep a *Journal* without a *Waſte-Book*, or a *Waſte-Book* without a *Journal*, ſince they both import one and the ſame thing, though they differ a little in Words, or expreſſing: For the Leaves of both are numbered by Pages, or Parcels as ſome do.

But however, I ſhall give Methods of keeping each as far as Room will give me Leave

(1)

The Waſte-Book.

London, January 1*ſt*, ———— 1750.

An Inventory of all my Effects of Money, Goods, and Debts, belonging to me, A. B. *of* London, *Merchant*, viz.		
In Caſh for trading Occaſions	3500,—,—	
In Tobacco 4726 *lb.* at 9 *d. per lb.*	177, 4, 6	
In Broadcloth 6 Pieces, at 50 *s. per* Piece	15,—,—	
Dowlas 1000 Ells, at 2 *s.* 4 *d. per* Ell	116, 13, 4	
Canary Wines 9 Pipes, at 30 *l. per* Pipe	270,—,—	
Due to me from *Henry Bland*, *per* Bond	60,—,—	
		4138.17,10

(1)

Journal.

Inventory, &c. *as above.*

				l.	*s.*	*d.*
—		Sundry Accts. Dr. to Stock—4138,17,10				
		viz				
1	1	Caſh for Trading Occaſions	3500,—,—			
		Tobaccoes 4726 *lb.* at 9 *d. per lb.*	177, 4, 6			
	1	Broadcloths 6 Pieces, at 50 *s, per* Piece	15,—,—			
	1	Dowlas 1000 Ells, at 2 *s.* 4 *d. per* Ell	116, 13, 4			
	1	Canary Wines 9 Pipes, at 30 *l. per* Pipe	270,—,—			
	3	*Henry Bland* due on Bond	60,—,—			
				4138	17	10

I ſhall make one Page ſerve for Waſte-Book and Journal Entries, to ſave room, and alſo to have both Methods of Entry under Eye, to make them more intelligibly uſeful to the Reader, he hereby being not obliged to turn over-Leaf to ſee their Difference of Entry.

1 *Waſte-Book.*

London, January 1*ſt*, 1750.

				l	*s*	*d.*
Owing to *William Webb*, by Note of my Hand	50	—	—			
Ditto to *Roger Ruff*, to ballance his Account	16	12	4			
Ditto to *Henry Hern*, due the 4th of *May* next	62	—	—			
				128	12	4

Journal.

1	Stock Debtor to Sundry Accounts,						
—	*l.* 128—12—4——*viz.*						
3	To *William Webb*, by Note of my Hand	50	—	—			
4	To *Roger Ruff* for Ballance of his Account	16	12	4			
5	To *Henry Hern*, due the 4th of *May* next	62	—	—	128	12	4

Waſte-

Waſte-Book.

2

	London, *Feb.* 2d ——— 1750		*l.*	*s.*	*d.*
	Sold *Thomas Townſhend, viz.*				
	246 *lb.* of *Virginia* Cut Tobacco, at 14 *d. per lb.*	14 07 —			
	460 Ells of Dowlas, at 3 *s. per* Ell ———	69 — —			
			83	07	—
	Feb. 2. *Journal.*				
6 —	*Thomas Townſhend*, Debtor to Sundries, *viz.*				
1	To Tobacco, for 246 *lb* at 14 *d. per lb.* ———	14 07 —			
1	To Dowlas, for 460 Ells, at 3 *s. per* Ell ———	69 — —			
			83	07	—
	Waſte-Book. Ditto 24th.				
	Bought of *Leonard Legg*, 4 Pipes of Canary, at 28 *l. per* Pipe ——— To pay in 6 Months.		112	—	—
	Ditto 24th. *Journal.*				
1 — 2	Canary Wines Debtor to *Leonard Legg*, for 4 Pipes, at 28 Pounds *per* Pipe—— To pay in 6 Months.		112	—	—

The ſhort Lines ruled againſt the Journal Entries are, or may be, termed Poſting Lines, and the Figure on Top of the Lines denotes the Folio of the Leidger where the Debtor is entered; and the Figure under the Line ſhews the Folio of the Leidger where the Credit is entered; and the other ſmaller Figures againſt the ſundry Debtors, or ſundry Creditors (whether Goods or Perſons) ſhew alſo in what Folios of the Leidger they are poſted. And the Figures in the narrow Column toward the Left-hand of the Pounds, Shillings, and Pence Lines, direct to the Folio in the Leidger where the Debit or Credit is poſted;

that is, to the Accompt of Goods, or of the Perſon immediately following the Words *To* or *By*; the firſt being proper to the Left or Debit Side of the Leidger; and the other uſed always on the Right or Credit Side of the Folio's in the Leidger.

There are ſeveral other Books uſed by Merchants beſides thoſe three before-mentioned; as the *Caſh-Book*, which is ruled as the Leidger, and folio'd likewiſe, wherein all Receipts of Money are enter'd on the Left-hand Folio, and Payments on the Right; ſpecifying in every Entry the Day of the Month (the Year being ſet on the Top) for what, and for whoſe Account the Money was received, or paid; and the Total Debit or Credit of each Side is to be poſted into the Leidger, to the Accompt of Caſh therein, in one Line of either Side, *viz.* to, or by ſundry Accompts, as *per* Caſh-Book, Folio, *&c.* which is to be done once a Month, or at Diſcretion; and the Particulars of each Side, Article by Article, are to be poſted into the Leidger to the proper Accompts unto which they belong; with References in the Caſh-Book to the ſeveral Folio's in the Leidger; and carry the Balance over-Leaf in the Caſh-Book; by which you may know at any time what Caſh you have, or ought to have by you.

Another Book, is a Book of Charges of Merchandize, wherein is to be entered the Cuſtom and petty Charges of any ſhipp'd Goods; as Porterage, Wharfage, Warehouſe-room, *&c.* and once a Month is transferred into the Caſh-Book on the Credit Side, making Reference to the Book of Charges of Merchandize; and likewiſe the ſame in the Debtor Side of the ſame Accompt in the Leidger for the Particulars thereof.

The next Book I ſhall name, is the Invoice-Book, or Book of Factories: In this Book is to be copied all Invoices or Cargozones of Goods ſhipped, either for Accompts proper or partable; and alſo of Goods received from Abroad, which muſt always be entered on the Left-ſide, leaving the Right-ſide Blank; and on the Advice of the Diſpoſal of Goods ſent Abroad, and alſo on the Sale of Goods received from Abroad, enter them on the Blank or Right-ſide; ſo at firſt View may be ſeen how the Accompt ſtands, *&c.*

The next a Bill-Book, wherein is entered Bills of Exchange accepted, and when they become due; and when paid, made ſo in the Margin.

The next is a Book of Houſhold Expences, for the Monthly Charge ſpent in Houſe-keeping; likewiſe Apparel, Houſe-rent, Servants Wages, and Pocket Expences; and this may be monthly ſummed up, and carried to the Credit of Caſh.

Beſides the above-mentioned, there muſt be a Book to copy all Letters ſent Abroad, or beyond the Seas; wherein the Name of the Perſon or Perſons to whom the Letter is ſent, muſt be written pretty full, for the readier finding the ſame.

The next is (and what is very neceſſary) a Receipt Book, wherein is given Receipts for Money paid, and expreſſed for whoſe Accompt or Uſe, or for what it is received; to which the receiving Perſon muſt ſet his Name for himſelf, or ſome other, with the Year and Day of the Month on the Top.

Laſtly, a Note or Memorandum-Book, to minute down Affairs that occur, for the better Help of Memory; and is of great Uſe where there is Multiplicity of Buſineſs.

Having given an Account of the ſeveral Books and their Uſe, the next Thing neceſſary will be, to give ſome few Rules of Aid, to enable the Book-keeper to make proper Entries; and to diſtinguiſh the ſeveral Debtors and Creditors, *viz.*

Firſt, For Money received, make Caſh Dr. to the Party that paid it (if for his own Accompt) and the Party Cr.

Secondly, Money paid, make the Receiver Dr. (if for his own Accompt) and Caſh Cr.

Thirdly, Goods bought for ready Money, make the Goods Dr. to Caſh, and Caſh Cr by the Goods.

Fourthly, Goods ſold for ready Money, juſt the contrary, *i. e.* Caſh Dr. and the Goods Cr.

Fifthly, Goods bought at Time; Goods bought are Dr. to the Seller of them, and the Seller Cr. by the Goods.

Sixthly, Goods ſold at Time, juſt the contrary, *i. e.* the Party that bought them is Dr. to the Goods, and the Goods Cr. by the Party.

Seventhly, Goods bought, part for ready Money, and the reſt at Time: Firſt, make the Goods Dr. to the Party, for the Whole, Secondly, make the Party Dr. to Caſh for the Money paid him in part of thoſe Goods.

Eighthly, Goods ſold, part for ready Money, and the reſt at Time: Firſt, make the Party Dr. to the Goods for the whole. Secondly, Caſh Dr. to the Party received of him in part of thoſe Goods.————Or either of theſe two laſt Rules may be made Dr. to Sundries; as Goods bought, Dr. to the ſelling Man for ſo much as is left unpaid, and to Caſh for ſo much paid in ready Money: And ſo on the contrary for Goods ſold.

Ninthly, When you pay Money before it is due, and are to have Diſcount allowed you, make the Perſon Dr. to Caſh for ſo much as you pay him, and to Profit and Loſs for the Diſcount; or make the receiving Man Dr. to Sundries, as before.

Profit and Loſs is Dr.

To Caſh for what Money you pay and have nothing for it, as Diſcount of Money paid you before due, and to Abatement by Compoſition, Houſhold Expences, *&c.*

Per Contra Cr.

By Caſh for all you receive, and deliver nothing for it; as Diſcount for prompt Payment, any Legacy left you, Money received with an Apprentice, and by the Profit of every particular Commodity you deal in, by Ships in Company, by Voyages, *&c.*

To balance or clear an Accompt when full written.

1. FIRST, if the Dr. Side be more than the Credit, make the Old Accompt Cr. by the New; and if the contrary, make the New Account Dr. to the Old: But if the Dr. Side be leſs than the Credit, then make the Old Accompt Dr. to the New, and the New Accompt Cr. by the Old, for ſuch a Reſt or Sum as you ſhall find in the Accompt.

2. An Accompt of Company, wherein you have placed more received of another than his Stock; then add as much on the Debit Side as you find on the Credit Side; to the end that, in the New Accompt, you may have ſo much Debit as you put in, and ſo much Credit as you have received.

3. In Accompts of Merchandize, you muſt enter the Gain, or Loſs, before you make the Old Accompt Cr. by the New, and the New Dr. to the Old, for the Remainder of Goods unſold.

4. In the Foreign Accompts, which you are to keep with a double Margin, or Column, for Dollars, Crowns, or any Foreign Coins whatſoever, which have been received or

paid by Bills of Exchange for Goods ſold by Factors or Correſpondents, or bought by them for the Accompts before; here you muſt firſt balance the ſaid inward Margin of Dollars, Crowns, *&c.*

To remove an Account full written to another Folio.

Sum or add up the Dr. and Cr. Sides, and ſee the Difference, which place to its Oppoſite: As admit the Cr. Side exceeds the Dr then you are to write the Line in the Old Accompt to balance on the Dr. Side, to anſwer the Line on the Cr. Side of the New Accompt.

How to balance at the Year's End, and thereby to know the State of your Affairs and Circumſtances.

YOU muſt make an Accompt of Balance on the next void Leaf or Folio of your Leidger to your other Accompts; but after ſo done, do not venture to draw out the Accompt of Balance in the ſaid Folio, 'till you have made it exact on a Sheet of Paper, ruled and titled for that Purpoſe; becauſe of Miſtakes or Errors that may occur or happen in the Courſe of balancing your Leidger; which are to be rectified, and will cauſe Eraſements or Alterations in that Accompt, which ought to be very fair and exact; and after you have made it to bear in the ſaid Sheet, copy fair the ſaid Accompt of Balance in the Leidger.

The Rules for balancing are theſe, *viz.*

1ſt, Even your Accompt of Caſh, and bear the Nett Reſt to balance Dr.

2dly, Caſt up all your Goods bought, and thoſe ſold, of what kind ſoever, in each Accompt of Goods; and ſee whether all Goods bought, be ſold or not; and if any remain unſold, value them as they coſt you, or according to the preſent Market Price, ready Money; and bear the Nett Reſt to balance Dr.

3dly, See what your Goods or Wares ſeverally coſt, and alſo how much they were ſold for, and bear the Nett Gain or Loſs to the Accompt of Profit and Loſs.

4thly, Even all your Drs. and all your Crs. in order as they lie, and bear the Nett Reſt of ſeveral Dr. and Cr. to balance.

5thly, Even your Voyages, your Factors Accompts, wherein is either Gain or Loſs, and bear the Nett Gain or Loſs to the Accompt of Profit and Loſs; and the Goods unſold to balance.

6thly, Even the Accompt of Profit and Loſs, and bear the Nett Reſt to Stock or Capital, as an Advance to your Stock or Capital.

7thly, Even your Stock, and bear the Nett Reſt to balance Cr.

Then caſt up the Dr. and Cr. Sides of your Balance; and if they come out both alike, then are your Accompts well kept; otherwiſe you muſt find out your Error by pricking over your Books again, to ſee whether you have entered every Dr. and Cr. in the Leidger as you ought.

Note, *By pricking over the Book is meant, an examining every Article of the Journal, againſt the Leidger, and marking it thus,— or thus* † ; *and upon the ſecond Examination thus* ‡ ; *and upon a third Examination thus* ‖, *or any other Mark.*

Note alſo, *In all Accompts of Goods, you muſt keep a Column in the Middle of the Leaf, of each Side, for Number, Weight and Meaſure.*

And alſo Note, *That the Money, Wares, or Goods remaining in your Hands, and the Debts owing to you, muſt overbalance with the Nett Stock and Debts owing by you.*

Though all that hath been ſaid in relation to Book-keeping, and the ſeveral Rules thereunto belonging, may ſeem a little abſtruſe to the altogether Unlearned therein, yet there is no ſuch mighty Difficulty to inſtruct them as they may imagine: For theſe following Hints may render what hath been already ſaid, intelligible to an ordinary Capacity.

1ſt, Stick cloſe to the Text, or general Rule before-mentioned, *viz.* That all Things received, or the Receiver, are Debtor to all Things delivered, or the Deliverer; for this Rule holds good in all Caſes.

2dly, When the Dr. (whether Perſon or Goods) is known, the Cr. is eaſily underſtood, without mentioning it: For if *A* be Dr. to *B*, then *B* is Cr. by *A*, for what Sum ſoever it be: Alſo, if Goods be Dr. to *C*, then *C* is Cr. by thoſe Goods, for the Sum they amount to———— This I mention, becauſe that moſt Authors (if not all) that I have met with on the Subject of Book-keeping, ſpend a great many Words, which I think (begging their Pardon if I err) might be ſaved, in declaring the Creditor, as well as ſhewing the Debtor, when it may be underſtood, as aforeſaid.

3dly, This Art of *Italian* Book-keeping, is called *Book-keeping by Double Entry*, becauſe there muſt be two Entries; the firſt being a Charging of a Perſon, Money, or Goods; and the ſecond a Diſcharging of a Perſon, Money, or Goods.

4thly, Strictly note, That if the firſt Entry be on the Dr. or Left-hand Side of your Leidger, the next or ſecond Entry, muſt always be made on the Right or Credit Side of your Leidger; for whenever one Perſon or Thing is charged, then always another Perſon or Thing is diſcharged for the ſaid Sum, let it be what it will.

And ſo it is in balancing or evening an Accompt, and carrying it to another Folio; for if the old Accompt be evened by the Balance on the Credit Side, then the new Accompt muſt be debited or charged on the Debit Side, for the Sum that balanced the old Accompt.

Much more might be ſaid to this *Art of Book-keeping*, if I had Room; but I have plainly ſpoke to the principal Fundamentals thereof, which I hope may be ſufficient for the Inſtruction and Improvement of any intelligent Reader.

The next Matter I ſhall go upon, is to ſhew, or give Examples of various Kinds of Receipts, and promiſſory Notes; alſo Bills of Parcels in different Trades; likewiſe Bills of Book Debts, Bills of Exchange, with Remarks on them; and ſome other Precedents of Writings in Trade and Mercantile Affairs.

And firſt of Receipts of different Forms.

	l. *s.* *d.*
REceived *September* 23, 1749, of Mr. *Anthony Archer*, the Sum of Six Pounds Nine Shillings; I ſay received for my Maſter *Brian Burry*, *per* me *Caleb Catchmoney.*	6—09—00
London, September 23, 1749. REceived of Mr. *Kendrick Keeptouch*, Ten Pounds Eleven Shillings and Six Pence, in full Payment, *per* me *Henry Haſty.*	10—11—06

Note, *The Sum received muſt always be expreſſed in Words at length, and not in Figures, in the Body of the Receipt; but it may and ought to be expreſſed in Figures behind a Brace (as in the two foregoing Examples) as well as in the Body of the Receipt.*

When a Receipt is given in a Book, there is no Occaſion to mention the Man's Name of whom you receive the Money; becauſe that is implied, he being the Owner of the Book.

A Receipt in Part of Goods ſold.

	l. s. d.
Received the 24th of *September*, 1749, of Mr. *Timothy Truſtlittle*, Fifty Pounds in Part of *Indico* ſold him the 22d Inſtant, *per* me	50—00—00

Laurence Lovemoney.

A Receipt given in a Receipt Book.

Received the 26th of *September*, 1749, the Sum of Forty-five Pounds, by the Order, and for the Accompt of *George Greedy*, Eſq; *per*	45—00—00

Timothy Truſty.

Received the 27th of *September*, 1749, of Mr *Daniel Davenport* and Company, One hundred Pounds, on Accompt of Self and Partner, *per*	100—00—00

James Jenks.

Received the 28th of *September*, 1749, of Mr. *Peter Punctual*, Fifty five Pounds Sixteen Shillings and Nine Pence, in Part for Tobacco ſold him the 24th of *Auguſt* laſt, *per*	55—16—09

Fabian Funk.

Received the 29th of *September*, 1749, of the Honourable *Eaſt-India* Company, Three hundred and Fifteen Pounds Ten Shillings, *per* Order, and for the Accompt of *Peter Pepper*, *per*	315—10—00

Stephen Storax.

Received *October* 2, 1749, of the Governor and Company of the Bank of *England*, One thouſand ſix hundred Pounds Ten Shillings, for Self and Company, *per*	1600—10—00

Leonard Longpurſe.

Re-

	l. *s.* *d.*
Received the 5th of *October*, 1749. of the Worſhipful Company of *Grocers*, Forty-nine Pounds Fifteen Shillings, in full Payment for my Father *Peter Plumb*, *per* me *Peter Plumb*, junior.	49—15—0
Received the 6th of *October*, 1749, of the Right Honourable *Robert Weſley*, Eſq; Lord-Mayor of *London*, the Sum of Sixty Pounds, for the Uſe of the Worſhipful Company of *Haberdaſhers*, *per* *Caleb Careful*, Clerk.	60—00—00

A Rent-Gatherer's Receipt.

Received the 24th of *October*, 1749, of Mr. *Aaron Arable*, Twenty-five Pounds, in full for half a Year's Rent, due at *Michaelmas* laſt, and deducted for Taxes five Pounds, and for Repairs Two Pounds, together Seven Pounds; I ſay received for the Uſe of *Laurence Letland*, Eſq; by Virtue of his Letter of Attorney, *per* *Robert Rentrole.*	25—00—00
Received of Mr. *Timothy Tenant*, this 25th Day of *October*, 1749, Six Pounds for a Quarter's Rent, due at *Michaelmas* laſt, for my Maſter *Lancelot Letfarm*, *per* me *Francis Faithful.*	6—00—00
Received *Auguſt* 14, 1749, of Mr. *Peter Biſhop*, Twenty-nine Pounds Six Shillings, in Part of a Bill of Sixty Pounds, due the 3 of *Xber* next, to Mr. *Sampſon Shuffle*, *per* *Francis Fidell.*	29—06—00

*A **Receipt**, on the Back of a Bill of Exchange.*

September 30th, 1749, received the full Contents of the within mentioned, being 500 Pieces of Eight, *per* *Nathan Needy.*	500 *Pcs of* 8

Promiſſory Notes.

I Promiſe to pay to Mr. *Timothy Teazer*, Sixty Pounds, on the 20th of this inſtant *September*; Witneſs my Hand this 15th of *September*, 1749.

Daniel Dilatory.

l. 60—00—00

October 18*th*, 1749

I Promiſe to pay to the Honourable the Directors of the *South-Sea* Company, or Bearer, on Demand, Four hundred Fifty Pounds, for my Father *James Jones*,

William Jones.

l. 450

24th of *October*, 1749.

I Promiſe to pay unto the Governor and Company of the Bank of *England*, Two thouſand Pounds,

Nahum Neednothing.

l. 2000

October 24, 1749.

I Promiſe to pay to the *Royal African* Company, or Bearer, on Demand, Seven hundred fifty-ſix Pounds Ten Shillings and Nine-pence, for my Maſter, *Robert Regular*,

Lewis Martin.

l. 756—10—9

October 25, 1749.

I Promiſe to pay to the Honourable *Eaſt-India* Company, or Bearer, Five hundred Pounds, for *Henry Hudſon*,

Martin Moneybag.

l. 500

26th *October*, 1749.

I Promiſe to pay to Mr. *Chriſtopher Caſh*, five Pounds for Value received; witneſs my Hand this 26th Day of *October*, 1749.

Robin Ruck.

l. 5—00—0

A Note given by Two.

WE, or either of us, promiſe to pay to Mr. *Matthew Miſtruſt*, or his Order, ſix Pounds Sterling, on Demand, for Valued received: Witneſs our Hands this 27th of *September*, 1749.

Nathan Needy.
Samuel Surety.

l. 6—00—00

Witneſs Nicholas Notice.

A Bill of Debt.

MEmorandum, That I *William Want*, of *London*, Weaver, do owe, and am indebted unto Mr. *Timothy Truſt*, of *Weſtminſter*, Watchmaker, the Sum of Twenty-five Pounds Six Shillings of lawful Money of *Great-Britain*; which Sum I promiſe to pay to the ſaid *Timothy Truſt*, his Executors, Adminiſtrators, or Aſſigns, on or before the 10th Day of *December* next enſuing: Witneſs my Hand this 22d Day of *October*, 1749. *William Want.*

Witneſs Titus Teſtis.

Bill of Parcels.

IT is uſual, when Goods are ſold, for the Seller to deliver to the Buyer, with the Goods, a Bill of Parcels; which is a Note of their Contents and Prices, with a Total of their Value caſt up, *&c.* ——— Theſe Bills ought to be handſomely writ, and in methodical Order, according to the beſt and cuſtomary Way of each particular Trade.

I ſhall therefore ſhew the Forms of Bills of Parcels in ſome Trades and Profeſſions, with the ſhorteſt Methods of caſting up the ſeveral Articles in each Bill.

A Mercer's Bill.

London, September 26, 1749.

Bought of *Abel Atlas*, and *Ben Burdett*, viz.

12 Yds ¾ of rich flowered Sattin, at 12 *s.* 6 *d. per* Yd.
8 Yds of ſprigg'd Tabby, at 6 *s.* 3 *d. per* Yd.
5 Yds ¼ of Farrindon, at 6 *s.* 8 *d. per* Yd.
6 Yds of Mohair, at 4 *s.* 2 *d. per* Yd.
17 Yds ½ of Luteſtring, at 3 *s.* 4 *d. per* Yd.

16—7—8

Sometimes the Money is paid preſently, then the Receipt is made as follows:

Received the 26th of *September*, 1749, Sixteen Pound, ſeven Shillings, and eight Pence, in full of this Bill, for my Maſter *Abel Atlas*, and Company; *per* me

Francis Fairſpoken.

A Woollen-Draper's Bill.

London, September 24th, 1749.

Bought of *Benjamin Broadcloth*, 22d of *September*, 1749, *viz.* *s.* *d.*

7 Yards of fine *Spaniſh* Black, at———18—4 *per* Yd.
5 Yds $\frac{1}{2}$ of ditto, at ——— ———12—4 ditto
6 Yds $\frac{3}{4}$ of fine mixt Cloth, at———15—9 ditto
16 Yds $\frac{3}{4}$ of Frize, at ——— ——— 3—6 ditto
4 Yds of Drap-de-berry, at —— ——13—5 ditto
5 Yds $\frac{7}{8}$ of ſuperfine *Spaniſh* Cloth, at—18—10 ditto.

A Linnen-Draper's Bill.

September 26th, 1749.

Bought of *Marmaduke Muſlin*, viz.

16 Ells of Doulas, at 1 *s.* 4 *d.* *per* Ell.
14 Ells of Lockram, at 1 *s.* 3 *d.* *per* Ell.
22 Ells $\frac{1}{2}$ of Holland, at 3 *s.* 4 *d.* *per* Ell.
1 Piece of Cambrick, at 15 *s.*
85 Yds $\frac{1}{2}$ of Diaper, at 1 *s.* 10 *d.* *per* Yd.
19 Yds $\frac{3}{4}$ of Damaſk, at 4 *s.* 3 *d.* *per* Yd.
2 Pieces of Muſlin, at 18 *s.* 10 *d.* *per* Piece.

The ſeveral Articles of theſe Bills are purpoſely omitted being caſt up, for the Exerciſe of the Reader in the Rules of *Practice*; or by the Rules of *Multiplication of Money*, before ſhewn; which indeed is the beſt Method of all, for the ready caſting up the divers and ſundry Articles contained in any Bill of Parcels whatſoever.

Example.

We'll take the laſt Article of the Woollen-Draper's Bill, *viz.* 5 Yds $\frac{7}{8}$, *&c.* at 18 *s.* 10 *d.* *per* Yard.

5 $\frac{7}{8}$	18—10
	7
l. 4—14—2	
16—5 $\frac{3}{4}$	8) 131—10
Facit l. 5—10—7 $\frac{3}{4}$	16— 5 $\frac{3}{4}$

In this Example the Price is multiplied by the Quantity, *viz.* 5 Yards $\frac{7}{8}$, according to the Rules delivered in *Multiplication*

plication of Money; and the Product by 5 is *l.* 4—14—2: Then for the $\frac{7}{8}$ of a Yard, I multiply the Price of the Integer, *viz.* 18 *s.* 10 *d.* by the Numerator of the Fraction, *viz.* 7, and divide by the Denominator 8, and the Quotient is 16 *s.* 5 *d.* $\frac{3}{4}$, agreeable with the Rule ſpoken to in the Doctrine of Fractions.———Which 16 *s.* 5 *d.* $\frac{3}{4}$ added to the Product of 18 *s.* 10 *d.* multiplied by 5, gives *l.* 5—10—7$\frac{3}{4}$, as in the Operation above.

A Grocer's Bill.

Bought of *Robert Raiſin*, and *Peter Plumb*, *October* the 4th, 1749, *viz.* *C.* *qrs.* *lb.* *l.* *s.* *d.*
Sugar 2 Hhds qt—17—2—17 at 1—10—6 *per C.*
Raiſins 3 Barrels ——6—1—19 at 1—14—5
Tobacco 1 Hhd——4—0—12 at 4—19—4
Rice 1 Barrel———1—0—15 at 2—16—4
Pepper 1 Bag —— 1—3—19 at 3—12—4
Brimſtone ——— 2—1—19 at 1—19—1

A Hoſier's Bill.

Bought of *Silveſter Slipſtocking*, *October* 5th, 1749, *viz.*
5 Pair of Womens mixt Worſted Hoſe, at———5 *s.* 7 *d.*
3 pr. of Womens Silk Hoſe, at—— ——9 *s.* 4 *d.*
22 pr. of Mens Woollen ditto, at————3 *s.* 2 *d.*
8 pr. of Womens ditto, at—————2 *s.* 2 *d.*
21 yds. of Flannel, at ——— ——— ———1 *s.* 11 *d.*
8 pr. of Thread Hoſe, at ——— ——— —3 *s.* 4 *d.*

The beſt and moſt expeditious Way of caſting up theſe ſeveral Articles is by the Methods ſhewn in *Multiplication of Money.*

A Fiſhmonger's Bill.

Bought of *Leonard Ling*, 6th of *October*, 1749.
3 *C.* of Haberdine, at——— *l* 7—10—6 *per C.*
1 $\frac{1}{2}$ of Ling, at——— 8—12—6
1 *C.* $\frac{1}{2}$ of Stock-fiſh, at——— 4—10—6
6 Barrels $\frac{1}{2}$ of white Herrings — 3—10—2
1 Barrel of red Herrings——— 2—12—6
95 dried Salmon, at——— 0—10—2

The Amount of each Article is purpoſely omitted for the young Man's Exerciſe in *Arithmetic*.

Note, *Haberdine or Ling*, 124 *is a Hundred: Stock-fiſh and Herrings*, 120 *to the Hundred*, 1200 *to a Thouſand and* 12 *Barrels a Laſt.*

A Leatherſeller's Bill.

Bought of *Henry Hide*, the 7th of *October*, 1749, *viz.*

		s.	d.	l.
15 Large oil'd Lamb Skins, at		1	3 ½ *per* Skin.	
13 Kipp of Goat Skins, at		3	4	
137 Allom'd Sheep Skins, at		1	3	
19 Calve-ſkins, at		4	3	
85 Oil'd Buck Skins, at		12	9	
10 Ruſſia Hides, at		12	9	
60 Dicker of Hides, at	*l.* 15	11	6	

Note, 50 *Goat-Skins make a Kipp*; *and other Skins, five-ſcore to the Hundred. A Dicker is* 10 *Hides or Skins*; *and* 20 *Dickers a Laſt.*

A Pewterer's Bill.

Bought of *Andrew Antimony*, *October* the 7th, 1749, *viz.*

	l.	s.	d.
9 Hard Metal Diſhes wt. 42 at 14 *d. per lb.*	2	9	—
1 Dozen of ditto Plates	0	17	—
1 Chamber-pot of ditto	0	4	—
1 Standiſh of ditto	0	4	—
2 Tankards of ditto	0	5	10
18 Beſt Spoons	0	4	6
3 Hard Metal Porringers	0	3	—
1 Salt of ditto	0	1	10
1 Set of Caſtors	0	19	—
	4	19	2

Examples of Caſting.

22 pr. of Woollen Hoſe,
at 3 *s.* 2 *d. per* Pair
7 and 3

1—2—2
3

3—6—6
3—2 the odd Pair.

l. 3—9—8 *Anſwer.*

42 *lb.* of Pewter, at 1—2
7

8—2
6

Anſwer l. 2—9—0

Bills on Book Debts.

A Woollen-Draper's Bill.

1749		Mr. *Francis Frize*, Dr.	s.	d.	
April	20	To 16 Yds ½ of Black Cloth, at	18	3	*per* Yd.
ditto	24	To 4 Yds ⅛ of Drap-de-berry, at	15	6	
May	4	To 35 Yds of mixt Grey Cloth, at	10	5	
	17	To 9 Yds of fine ditto, at	17	3	
June	12	To 12 Yds ½ of fine Broad Cloth, at	17	3	

If the Gentleman pays the whole Bill, then make the Receipt thus:

Received the 19th of *Octob.* 1749, of Mr. *Francis Frize*, the Sum of Fifty-four Pounds, *&c.* in full of this Bill and of all Accompts, for my Maſter, *David Draper*; *per* *Michael Meaſurewell.*	*l.* 54, *&c.*

A Mercer's Bill.

1749		Madam *Dinah Dilatory*, Dr. to *Bryan Brocade*, viz.			
		Yds.	*s.*	*d.*	
Mar.	16	To 16 ½ of flower'd Sattin, at	14	9	*per* Yd.
April	14	To 14 of Venetian Silk, at	11	8	
ditto	16	To 99 of Mohair, at	6	3	
May	16	To 14 ½ of flower'd Damaſk, at	9	7	
June	7	To 5 ⅛ of Genoa Velvet, at	21	6	
ditto	25	To ¾ of Luteſtring, at	4	7	

If Part of the Bill is paid, write thus:

Received of Madam *Dinah Dilatory*, Twelve Pounds Ten Shillings, in Part of Payment, for my Maſter *Bryan Brocade*; *per* *Henry Hunter*.	*l.* 12	*s.* 10	*d*

A Corn-chandler's Bill.

1749		Mr. *Robert Racer*, Dr. to *Lionel Livery*.	*s.*	*d.*	
April	24	To 5 Quarters of Oats, at	2	3	*per* Buſh
May	16	To 9 Buſhels of Beans, at	4	10	
June	19	To 7 Buſhels of Bran, at	1	10	
		To 19 Buſhels of Oats, at	1	11	
ditto	24	To 16 Buſhels of Beans, at	3	11	

A Tobacconiſt's Bill.

1749		Mr. *Francis Fume*, Dr. to *Richard Raiſecloud*, viz.	*d.*
May		To 1 Hhd of Tobacco, qt. nett, 569 *lb.* at ——— ————	$10\frac{1}{2}$ *per lb.*
ditto	25	To 1 Box, qt. 75 $\frac{1}{2}$ *lb.* nett, at—	$11\frac{3}{4}$
June	4	To 5 Bags of Old *Spaniſh*, qt. nett, 671 *lb.* at————	$3\frac{1}{4}$
July	12	To $\frac{1}{2}$ Hhd qt. 334 Groſs, Tare 42, nett, 293 *lb.* at——— ———	$5\frac{1}{4}$
7ber	7	To 2 Rolls of Tobacco, qt. 94 *lb.* at	$9\frac{1}{8}$

A Stationer's Bill.

1749		Mr. *Siſcera Scribler*, Dr. to *Phineas Foolſcap*, viz. Reams	*s.*	*d.*
July	12	To 57 of Demy Paper, at ——	10	9 *per R.*
ditto	31	To 195 of 2d Foolſcap, at——	6	3
Aug.	24	To 375 of 2d Demy, at——	8	2
7ber	6	To 95 of French Royal, at——	2	6
8ber	26	To 26 Rolls of Parchment, at—	15	11

Note, *A Roll of Parchment is* 60 *Skins: A Ream of Paper* 20 *Quires; and a Bale of Paper* 10 *Reams.*

A Bricklayer's Bill.

1749		Mr. *Martin Meſſuage*, Dr. to *Peter Pantile*, viz
Mar.	27	To 25 Thouſand of Bricks, at 16 *s. per* M.
ditto	30	To 11 Thouſand Plain Tiles, at 20 *s.* 6 *d. per* M.
April	1	To 28 C. of Lime, at 12 *s. per C.*
ditto	9	To 20 Load of Sand, at 3 *s.* 6 *d. per* Load.
May	20	To 140 Ridge Tiles, at 8 *s.* 6 *d. per C.*
June	24	To 90 Days Work myſelf, at 3 s. *per* Day.
		To 90 Days my Man, at 2 *s.* 6 *d.*
		To 90 Days another Bricklayer, at 2 *s.* 6 *d.*
		To 90 Days for 2 Labourers, at 20 *d* a Day each.

Note, 1000 *plain Tiles is* 1 *Load; and* 25 *Bags or Buſhels of Lime* 1 C. *A Brick muſt be* 9 *Inches long, and* 4 *Inches* $\frac{1}{2}$ *broad. Bricks are of three Sorts,* Plaice Bricks, Red and Grey Stock Bricks.——

Here it is neceſſary to give a general Rule for the caſting up any Thing ſold by the Thouſand; as Bricks, Tiles, Clinkards,

kards, or *Flanders* paving Bricks, and ſeveral other Things mentioned in the Book of *Rates*, *viz.* Barrel Hoops, Gooſe Quills, Oranges and Lemons, Squirrel Skins, Billets, &c.

And the eaſy Rule is this, viz.

Multiply the given Number by the Shillings in the Price, (if the Price be at ſo many Shillings *per M.*) and always cut off three Figures or Places toward the Right hand; and the Figures toward the Left-hand are Shillings, which divide by 20, to bring them into Pounds: And thoſe Figures ſeparated towards the Right-hand, multiply by 12, the next inferior Denomination; and ſtill cut off, or ſeparate three Places toward the Right-hand, and the Figures toward the Left are Pence; and the three laſt Figures cut off, multiply by 4; and ſtill ſeparate three Places toward the Right-hand, and the Figures toward the Left are Farthings.——And if the Price be Shillings and Pence *per* Thouſand, then reduce the Price into Pence, and multiply the given Number by the Pence contained in the Price, cutting off three Places toward the Right as aforeſaid; and the Figures toward the Left are Pence, which bring into Pounds, according to Rule; and multiply the Remainder, or Figures cut off, by 4, &c.

Example.

24650 Bricks, at 17 *s.* *per* Thouſand.
17

172550
24650

Anſ. Shillings 41,9|050 20 *l.* 19 *s.* and $\frac{600}{1000}$ of a Shilling.
or *l.* 20,19$\frac{12}{600}$

261324 plain Tiles, at 16 *s.* 6 *d.*
198 12

198 *d.*

2090592
2351916
261324

Pence 51742,152
Divide *per* 12) 4

20) *s.* 431,1—10*d.* 608

l. 215—11—10 and $\frac{608}{1000}$ of a Penny.

When Things bought by the Thouſand, are retailed by the Hundred, as particularly *Dutch* and *Engliſh* Pantiles; then follow this Rule, *viz.*

Multiply the given Quantity by the Price, whether Shillings, or Shillings and Pence. If Shillings, multiply by the Number of Shillings, and cut off two Figures or Places toward the Right-hand; and thoſe toward the Left are Shillings; which reduce to Pounds as uſual; and what remains, that is, the Figures cut off, multiply by 12; and again, cut off two Places more toward the Right-hand, and the Figures to the Left are Pence; and what remains multiply by 4, *&c.*

Example.

1726 Pantiles, at 7 *s. per* C.

7

120|82

12

9|84

4

3|36

That is, 6 *l.* 00 *s.* 9 *d.* $\frac{3}{4}$ and $\frac{36}{100}$ of a Farthing.

If the Price be Shillings and Pence, multiply by the Pence contained in the Price, and proceed as before; and then the Figures toward the Left-hand will be Pence; which reduce to Pounds according to Rule.

Example.

2964 Stock Bricks, at 2 *s.* 6 *d. per* C.

30 Pence

Pence 889|20

4

80

That is, 3 *l.* 14 *s.* 1 *d.* and $\frac{80}{100}$ of a Farthing, or $\frac{20}{100}$ of a Penny.

This Method is preferable to *Practice*, becauſe of its Exactneſs for the odd Number above Thouſands or Hundreds, which would be puzzling to be very exact as to the odd Number; but by this Method, the Queſtion is ſolved to the 1000 or 100 Parts of a Farthing; as may be ſeen by the foregoing Examples of the Operation.

Of Bills of Exchange.

BILLS of Exchange are either Inland, or Foreign: The Inland Bills are drawn by one Trader in one City or Town, upon another of another City or Town in the ſame Kingdom; as *London* upon *Briſtol*, or *Exeter* upon *London*, *&c.* and theſe chiefly concern our Shop-keepers, and Wholeſale Traders either of Town or Country; and the Foreign more immediately concern the Merchant.

Bills of Exchange, if handſomely drawn, muſt be written in a fair Hand, on a long Piece of Paper, about three Inches broad, and writ in Form after the following Precedents.

A Bill payable at Sight.

London, 5th, *October*, 1749.

AT Sight hereof, pay to Mr. *Gregory Greedy*, or his Order, the Sum of Fifty Pounds, for Value received of *Chriſtopher Caſh*; and place it to Accompt, as *per* Advice of

To Mr. Peter Punctual, Your humble Servant,
Grocer, in High-ſtreet *Daniel Drawbill.*
in Briſtol.

Note. A Bill at Sight is payable three Days after the Acceptor ſeeth it.

Exon, *November* 4th, 1749.

SEven Days after Sight hereof, pay to Mr. *Nathan Needy*, or his Order, twenty-four Pounds ten Shillings, for the Value received here of Mr. *Timothy Transfer*, and place it to Accompt, as *per* Advice from

To Mr. Simon Certain, Your Friend and Servant,
Haberdaſher, *in* Milk- *Michael Moneyman.*
ſtreet, London.

If Mr. *Needy* ſends his Servant, *Andrew Benſon*, to receive the Money; after he hath writ his Name on the Back of the Bill, (which is his Order) the Servant muſt write a Receipt to his Maſter's Name, thus;

R*Eceived* November 16, 1749, *the full Contents of the within-mentioned Bill, being twenty-four Pounds, ten Shillings.*

Witneſs, *Nathan Needy.*
Andrew Benſon.

A

A Foreign Bill of Exchange.

London, 6th *October*, 1749, for 460 Crowns, at
56 *d.* $\frac{2}{8}$ Sterling *per* Crown.

AT Uſance pay this my firſt Bill by Exchange (my ſecond or third not being paid) unto Mr. *Henry Vernon*, or Order, four hundred and ſixty Crowns, at 56 *d.* $\frac{2}{8}$ *per* Crown, for the Value received of Mr. *Samuel Thompſon*, and paſs it to Accompt, as *per* Advice from, Sir,

To Mr. Will. Walker, Your humble Servant,
Merchant in Paris. *Ebenezer Reynolds.*

Another.

London, 17th *October*, 1749, for 480 Dollars, at
55 *d.* $\frac{1}{8}$ *per* Dollar.

AT three Uſance pay this my firſt *per* Exchange, unto Mr. *William Wealthy*, or Order, four Hundred and eighty Dollars, at 55 *d.* $\frac{1}{8}$ Sterling *per* Dollar, for the Value received of himſelf, and place it to Accompt, as *per* Advice from

To Meſſrs. Daniel *and* Your humble Servant,
David Bernardiſton, *Mark Mercator.*
Merchants in Aleppo.

Note, Uſance *in* England, *is a Calendar Month, and* Double Uſance *two Months, &c.*

Once more.

Briſtol, 8 *October*, 1749, for 600 Pieces of Eight, at
53 *d.* $\frac{3}{8}$ *per* Piece.

AT double Uſance pay this my firſt Bill of Exchange unto Mr. *Lawrence de Luz*, or his Order, ſix hundred Pieces of Eight *Mexico*, at fifty-three Pence $\frac{3}{8}$ Sterling *per* Piece of Eight, for Value received of *Gomez Henriquez*, and paſs it to Accompt, as *per* Advice from yours,

To Mr. Simon Surepay. *William-Henry Hern.*
Merchant in Leghorn.

Notes on Bills of Exchange.

1. THE *Acceptor of any Bill is become abſolute Dr. to the Perſon to whom the Bill is payable for the Contents thereof.*

2. *The Perſon to whom the Bill is payable, muſt demand the Money the very Day it becomes due, and if the Acceptor die before it becomes due, it muſt be demanded of the Executor or Adminiſtrator.*

3. *The Drawer of any Bill muſt always give his Correſpondent a Letter of Advice, that he hath drawn ſuch a Bill on him for ſuch a Sum,* &c.

4. *None may pay a Bill without ſuch a Letter of Advice.*

5. *A Bill is due the third Day after the Expiration of the Time mentioned in the Bill.*

Of Endorſing.

IT frequently happens, that between the Acceptance of a Bill, and the Time of Payment, the Party to whom it is firſt made payable, hath occaſion to pay it away; if ſo, he writes his Name on the back of the Bill, which is his Order, (as ſaid before) and gives it to the Perſon he is indebted to, and then he is impowered to receive the Money: And it may be, the ſecond Perſon alſo wants to pay it away; and then he writes his Name likewiſe under the other, and delivers it to a third Perſon to receive the Money; and it may be, the third does the ſame, and delivers it to a fourth Perſon, *&c.* All that do ſo, are Endorſers; and he that laſt hath the Bill, if the Acceptor will not pay it, may ſue him, or the Endorſers, or Drawer, or any of them, for the Money.

An Endorſement is generally in theſe Words, *viz. Pay the Content of the within-mentioned Bill to* Henry Haſty.

George Greedy.

But generally the Name only is accounted ſufficient.

Of Proteſting.

WHEN a Bill is to be *Proteſted*, the Party that hath the Bill muſt go to a *Publick Notary*, (not a common *Scrivener)* whoſe Buſineſs it is; and he goes with you to the Acceptor's Houſe, and demands Payment, *&c.* And then he draws up a *Proteſt* according to Law; which is to be returned to the Drawer within the time limited, *&c.*

It is needleſs to give here the Form of a *Proteſt*, becauſe no Man can do it of himſelf.

A Bill of Debt.

KNOW all Men by theſe Preſents, that I Lawrence Lackcaſh, of Southwark, Vintner, *do owe and am indebted to* Charles Creditman, *of the ſame Place*, Salter, *the Sum of one hundred and fifty Pounds of lawful Money of* Great-Britain; *which ſaid Sum I promiſe to pay unto the ſaid* Charles Creditman, *his Executors, Adminiſtrators, or Aſſigns,*

ſigns, on or before the 24th of December *next enſuing Date hereof. Witneſs my Hand and Seal this 6th Day of* Oct. 1749.

Sealed and delivered Lawrence Lackcaſh.
in the Preſence of

A Bill for Money borrowed.

R*Eceived and borrowed of* Oliver Overcaſh, *of* London, *Merchant, Fifty Pounds, which I do hereby promiſe to pay on Demand. Witneſs my Hand this 6th Day of* October 1749.

Peter Penury.

l. 50

The Charge of Noting and Proteſting a Bill.

		s.d.			s.d.
Noting,	within the City	1-6	Pro-teſting,	within	3-0
	without the City	2-6		without	5-0

The Form of a Bill of Lading.

SHipped, by the Grace of God, in good Order and well conditioned, (by *Edward Export*, of *London*, Merchant) in and upon the good Ship called (the *Bilboa Merchant* of *London)* whereof is Maſter under God for the preſent Voyage (*Martin Mizzen* of *London*, Mariner) and now riding at Anchor in (the Port of *London)* and by God's Grace bound for *(Cadiz)* to ſay (1 Bale
TB of Stocking Baize, and 1 Trunk containing five hundred
N° Pair of Silk Stockings, Contents, &c. as *per* Invoice)
1,2. being mark'd and number'd as *per* Margin, and are to be deliver'd in the like good Order at the aforeſaid Port of *(Cadiz)* the Danger of the Seas only excepted, unto (Mr. *Thomas Drake*, Merchant, there) or to his Aſſigns, he or they paying Freight for the ſaid Goods, (three Pieces of Eight *per C.* Wt) with Primage and Average accuſtomed. In witneſs whereof the Maſter or Purſer of the ſaid Ship hath affirmed to (three) Bills of Lading, all of this Tenor and Date, one of which (three) Bills being accompliſhed, the other (two) to ſtand void. And ſo God ſend the good Ship to her deſired Port in Safety. *Amen.*

Dated in *London*, the 6th of *October*, 1749, Inſides and Contents unknown to *Martin Mizzen.*

Note, *The ſeveral Words included in the Parentheſis, are to be put into the ſeveral vacant Places that are in a Blank Bill of Lading.*

Note alſo, *Average is ſometimes the general Allowance made to the Maſter of the Ship, of* 1 d. *or* 2 d. *in every Shilling Freight Primage, a ſmall Allowance to be diſtributed among the Sailors.*

The Forms of an Invoice.

Port-Royal in *Jamaica, July* 24, *Anno* 1749.

INVOICE of five Barrels of Indico, five Hhds of Sugar, and five Hhds of Pymento, ſhipped on board the *George* of *London, George Jones,* Commander, for Accompt and Riſque of Meſſrs. *John* and *Thomas Fiſher,* of *London,* Merchants, being mark'd and number'd, as *per* Margent; Contents, Coſts and Charges, as in the following Example.

viz.	Indico 5 Barrels				
IF	143 *lb.*		*l.*	*s.*	*d.*
	143				
	146				
N°	152				
1a5	172				
	756 *lb.* nett, at 2 *s.* 2 *d.* per *lb.*—		81	18	—
	Sugar 5				
	Hhds Tare				
	C. qr. lb. *C qr. lb.*	*C. qr. lb.*			
	11-3-27—1-2-19	Groſs 68-0-00			
	12-2-19—1-3-00	Tare 8-3-12			
	13-2-13—1-2-16				
1a5	14-1-15—1-3-11	Nett 59-0-16			
	15-1-10—1-3-22	at 24 *s. p. C.*	70	19	5
	68-0-00—8-3-12				
	Pymento	*lb.*			
	3 Hhds. Tare	2026 Groſs			
	lb. *lb.*	389 Tare			
	432——84				
	396——72	Net 1637 at 11 *d.* $\frac{1}{4}$ *per lb.*	76	14	8$\frac{1}{4}$
	410——81				
	376——70	Charges			
	412——82	To Coſt of 5 Barrels and			
		10 Hhds. 4-7-9			
	2026—389	To Storage———1-0-0	5	7	9
			234	19	10$\frac{1}{2}$
		To Commiſſion at 5 *p. C*	11	14	11$\frac{3}{4}$
		Errors excepted *per A. B.*			

An Account of Sales.

Port-Royal, in *Jamaica*, *July 24th*, 1749.

OF 2765 Ells of brown Ozenbrigs, 1112 Yards of blue Hartford, 2 Pieces of Grey Cloth, qt. 39 Yards, 40 Pair of fine Worſted Hoſe, and 170 Ells of Bag Holland, received from on board the Ship *Good Succeſs*, Capt *Samuel Sharp*, Commander, for Account of *Laurence Lucky*, of *London*, Merchant, is Dr.

	l.	*s.*	*d.*
To Portage of ditto —— *l.* 00—17—6 To Commiſſion of Sales——12—16—3 To Storage at 2½ *per C.*——06—08—1½			
	20	1	10½
To balance of the Nett Product carried to the Credit of your Account, bad Debts excepted. ——————	236	3	9½
	256	5	8
Per Contra Cr.			
By 2765 Brown Ozenbrigs, making 3456 Yds ¼ at 8*d.* ½ *per* Yd ſold *Ambique Baker*	122	10	2
By 1112 Yds of blue Linnen, ſold at 7*d.* ¾ *per* Yard ————————	34	3	5
By *James Smart*, for 39 Yds of Cloth, at 15 *s. per* Yard ————————	29	5	0
By *Laurence Monk*, for 50 Pair of Hoſe, at 7*s.* 10*d. per* Pair ————————	15	13	4
By ditto for 175 Ells of Bag Holland, at 6*s.* 3 *d. per* Ell————————	54	13	9
	256	5	8

Errors excepted, *July 24th*, 1749, *per*
Charles Careful

Buſineſs at the Waterſide, concerning Exporting and Importing of Goods, &c. *Entering them at the Cuſtom-houſe*, &c.

WHEN there are Goods to export, and ready pack'd, *&c.* there muſt firſt be made a Bill of Entry (as it is called) of the Contents, after this Form, *viz.*

In the *Loyal Merchant*, *William Worm*, for *Barbadoes*,
Edwin Export.

Three Caſes of Haberdaſhery.
Five Tuns of Beer, *&c.*

Of theſe Bills there muſt be ſeven, one of which muſt be in Words at length, and the other may be expreſſed in Figures: Theſe are by the Clerks of the Cuſtom-houſe entered into ſeveral Books for that Purpoſe.——If ſome Goods pay Cuſtom, and others not, then there muſt be made two Entries; one for thoſe that pay Cuſtom, and another for thoſe that pay not; and likewiſe you muſt have two Cockets.

A *Cocket* teſtifies the Payment of all Duties; and is writ on a ſmall Piece of Parchment, in the following Words:

Know ye, That Edwin Export, *Merchant, for three Caſes of Haberdaſhery, and five Tuns of Beer, in the* Loyal Merchant, William Worm, *for* Barbadoes, *hath paid all Duties. Dated 9th* November, 1749.

On the Backſide of the *Cocket* you muſt ſet down the Marks, Numbers, and Quantity of the Goods expreſſed in the Inſide——When on clean Paper you tranſcribe your Bill of Entry; upon which a Shipping Bill will be made out; on the Back of which, ſignify the Marks, Numbers and Contents, as before on the *Cocket*; both which being thus Endorſed, you are to deliver them to the Searcher at the Waterſide, who depoſits them in the Office 'till the going away of the Ship, and then they are delivered to the Captain or Maſter of the Ship.

If you have not Judgment or Experience enough to enter your Goods yourſelf, 'tis but applying yourſelf to any one of the Clerks in the Long-Room, who make it their Buſineſs (and good Buſineſs too) to enter People's Goods; and for a Shilling (you giving them the Contents) they will write your Bills, and paſs your Entries, without giving you any further Trouble, or your running any Riſque of making any falſe Entries, *&c.*

Entry Inwards.

THE Ship being arrived, ſearch the Entry-Book in the Long-Room, and you will find the Name of the Ship and Captain, as alſo the Waiters that are to attend the Delivery of the Ship, and at what Key the Goods will be landed. The Entry Inward runs thus:

In the Mercury, John Keenhaul, *from* Antègoa.
25 Hhds of Sugar, *&c.*
56 Bags of Cotton, *&c.*

There muſt be eight of theſe Bills, (though but ſeven Outwards) and one of theſe muſt be in Words at length, (as well as one of the ſeven Bills Outwards) which is for the Warrant of Delivery; and muſt be ſigned by the Perſon in whoſe Name the Goods are entered; and the Mark alſo in the Margin; which being done, and the Fee for Entry, and Cuſtom paid, you will then have from the Land-Waiters a Warrant for the Landing and Receiving your Goods.

When Goods are to be exported by Certificate, *viz.* Foreign Goods formerly imported; theſe Goods being to be ſent Abroad, or exported to another Place or Country by a Native of *England* within Twelve, or a Stranger within Nine Months after Importation, entitles the Exporter to a Drawback of Part of the Cuſtom paid at the Importation of the ſaid Goods, (producing a Certificate from the Comptroller, that they have paid the Duties Inwards.) And the Debenture of Cuſtom Drawback runs thus:

Debenture.

CHriſtopher Commerce, *Natural born, did on,* &c. *make an Entry with us of Two thouſand Ells of* broad German *Linen, in the* Amazon, *Capt.* Stephen Stout, *for* Jamaica, *the Subſidy,* &c. *was paid Inwards by,* &c. *as appears* per *Certificate of the Collector Inwards: And for farther Manifeſtation of his juſt Dealing therein, he hath alſo taken Oath before us of the ſame.*

Cuſtom-houſe, London, 9*th* November, 1749.

The Oath.

Jurat C. C. *That two thouſand Ells of broad* Germany *Linen, above-mentioned, was really Shipped out, and hath not been relanded in any Port or Creek in* England *or* Wales, *ſince laſt Shipped,* Nov. 9, 1749.

The Certificate Cocket.

London; *Know ye, that* C. C. *for two thouſand Ells of broad* Germany *Linen, paid* per, *&c. the Day,* &c. *laſt, late unladen, and now in the* Amazon, Stephen Stout, *for* Jamaica. *Dated the 9th of* November, 1749.

This *Certificate Cocket* is gained by applying to the Books of the Importer, to know the Day, *&c.* when the Cuſtom Inward was paid, and by whom; which carry to the Long-Room in the *Cuſtom-houſe*, and deliver it to the Comptroller's

Clerk of the Subſidy Inward and Outward, with an Account of what you would export, *&c.*

A little before was mentioned at what Key the Goods ſhould be landed, and therefore here it is proper to name the Keys (or rather Quays) and Wharfs that Goods are uſually landed at; which are theſe, *viz.*

Somer's Key, *Smart's Key*, *Wiggen's Key*, *Bear Key*, *Dice Key*, *Cuſtom-houſe Key*, *Potter's Key*, *Wool Key*, *Gally Key*, *Brewer's Key*, *Ralph's Key*, *Cheſter's Key*, *Lyon's Key*, *Cox's Key*; *Hammond's*, *Young's and Gaunt's Keys*. And the Wharfs are, *Freſh Wharf* and *Botolph Wharf*.

Beſides theſe, there are certain Places called *Docks*, which are Harbours cut into the Land, where there is no Current, but only a Flow, and an Ebb, occaſioned by the Riſe and Fall of the Tide in the River of *Thames*; and theſe are convenient for the Lying of Veſſels, Hoys, Lighters, Barges, and Boats; and are theſe, *viz.*

Billinſgate Dock, *Sabb's Dock*, *Tower Dock*, *St. Katharine's Dock*, *Wapping Dock*, *Hermitage Dock*, *Execution Dock*, and *Limehouſe Dock*. And above Bridge, *Queenhithe Dock*, *Puddle Dock*, *White Friar's Dock*, and *Scotland-Yard Dock*. And on *Southwark* or *Surrey* ſide, are *Saviour's Dock*, *Clink Dock*, *Savery's Dock* below the Bridge-yard, and *Shadwell-Dock*; and ſeveral others for private Uſes—But more particularly eminent on that ſide the Water, is the *Bridge-Yard* for Landing ſundry ſorts of Merchandizes, but chiefly from the Ports of *England*.

Of Wharfage and Lighterage.

WHarfingers have ſeveral Managers over them, and alſo a Committee to redreſs Grievances, *&c.* and Clerks of the Stations, with Lighter Managers, and have the Letting of many Warehouſes, (which now are very fine and commodious, being rebuilt ſince the ſad Fire in *Thames-ſtreet*) Cellars, *&c.* and have the Privilege of keeping Lighters for the Carriage of Goods to and from Ships.

The Rates of Wharfage

Are generally computed at 12 *d. per* Tun, whether Outward or Inwards: excepting Sugars from the *Weſt-Indies*, which pay 2 *s. per* Tun, 4 Hogſheads being accounted a Tun (though they weigh more;) Crainage is included in the 12 *d. per* Tun Wharfage; and for Lighterage, the Wharfingers have 12 *d. per* Tun for 4 Hogſheads of Sugar that come from the *Weſt-Indies*; and for Wine and other Goods, the Lighterage is half as much as the Wharfage.

Huſbands of Ships.

WHERE ſeveral Perſons are concerned in a Ship there is uſually a Huſband choſen by them, to take an Account of every Merchant's Goods, *&c.* and pay the Wharfage, Lighterage, Porterage, *&c.* and theſe Huſbands are to collect every Merchant's Proportion, when they do the Owner's Freight.

An Account of the ſeveral Counties of *England* and *Wales*, with their Produce, Market-Towns, and Market Days, *&c.*

Note. ***m*** ſtands for Monday, ***tu*** for Tueſday, ***w*** for Wedneſday, ***th*** for Thurſday, ***f*** for Friday, and ***ſ*** for Saturday.

Berkſhire

IS ſuppoſed to contain about 527000 Acres, is 120 Miles Circumference, hath Plenty of Corn, Cattle, Wool, and Wood, (eſpecially Oak) and is accommodated with Water Carriage, by the very fine Rivers of *Thames* and *Kennet*;

And hath theſe Market-Towns, viz.

Reading, the Shire-Town, Market-Day on Saturday,

Abbington, ***m*** and ***f***
Windſor, ***ſ***
Wallingford, ***tu*** and ***f***
Maidenhead, ***w***
Hungerford, ***w***

Newberry, ***th***
Farringdon, ***tu***
Wantage, ***ſ***
Eaſt-Iſley, ***w***
Oakingham, ***th.***

Buckinghamſhire

Is an Inland County as well as *Berkſhire*; it contains about 441000 Acres, is 138 Miles in Circumference, abounds in Corn and Cattle, and is very conſiderable for Wool. The principal Rivers in this Shire are *Tame, Ouze,* and *Coln.*

Market-Towns.

Buckingham, ***ſ***
Ayleſbury, ***ſ***
High Wickham, ***f***
Marlow, ***ſ***

Wendover, ***th***
Amerſham, ***tu***
Newport-pagnel, ***ſ***
Colebrook, ***w***

Stony Stratford, *f*
Oundle, *m*
Beconsfield, *th*
Cheſham, *w*
Riſborough. *ſ*
Invingho, *f*
Winſlow, *th*

Bedfordſhire

Contains about 260000 Acres, is 73 Miles in Circumference, well ſtored with Corn and Cattle, and famous for Fuller's Earth, *&c.*

Market-Towns.

Bedford, *th* and *ſ*
Dunſtable, *w*
Wooburn, *f*
Ampton Hill, *th*
Leighton, *m*
Luton, *m*
Shefford, *f*
Biggleſwade, *th*
Potton, *ſ*
Tuddington, *ſ*

Cambridgeſhire

Is an Inland County, contains about 570000 Acres, is 130 Miles in Circumference, and affords Plenty of Corn, Cattle, and Wild Fowl. *Cambridge* is the Shire Town, and remarkable for a famous Univerſity, cantaining 12 Colleges, and 4 Halls, all well endowed, and are as followeth. *viz.*

When Founded	COLLEGES.	By whom founded.
1284	*Peter Houſe,*	by Hugh de Batham, Biſhop of Ely.
1346	*Corpus Chriſti* or *Bennet.*	by Henry of Monmouth, Duke of Lancaſter.
1348	*Gonvil* and *Caius,*	ſo call'd from its ſeveral Founders.
1441	*King's*	by King Henry VI.
1448	*Queen's*	by Margaret his Queen.
1497	*Jeſus,*	by John Alcocke, L.L.D. Bp. of Ely.
1506	*Chriſt's*	by Margaret, Counteſs of Richmond.
1506	*St. John's*	by ditto.
1542	*Magdalen,*	by Edw. Strafford, D. of Buckingham,
1546	*Trinity,*	by King Henry VIII.
1584	*Emanuel,*	by Sir Walter Mildway.
1598	*Sidney Suſſex,*	by Frances Sidney, Counteſs of Suſſex.
	HALLS.	
1343	*Clare,*	by Richard Badew.
1347	*Pembrook,*	by Mary, Counteſs of Pembrook.
1353	*Trinity,*	by W. Bateman, Biſhop of Norwich.
1549	*Catherine,*	by Robert Wood, the Chancellor.

Mar-

Market-Towns.

Cambridge, *f*
Ely, *tu*
Caxton, *tu*
Linton, *th*
New-Market, *tu*
Merche, *f*
Wiſbich, *ſ*
Royſton, *w*
Soham, *ſ.*

Cheſhire

Is a Maritime or Sea-County, containing 720000 Acres, and is in Circumference about 118 Miles. Cheeſe and Salt are the principal Commodities: For the firſt, no Place in the World equals it; and for the latter, if there was but a ſufficient Quantity, there would be no Occaſion for Voyages to the Iſle of *May*.

Market-Towns.

Cheſter, *w* and *ſ*
Congleton, *ſ*
Namptwich, *ſ*
Middlewich, *ſ*
Norwich, *f*
Macclesfield, *m*
Frodſham, *w*
Stockport, *f*
Sandwich, *th*
Aſtringham, *tu*
Malpas, *m*
Knotsford, *f.*

Cornwall

Is a Maritime County in the moſt Weſtern Part of the Kingdom, containing about 960000 Acres, and is 150 Miles in Circumference. The chiefeſt Commodities are Tin and Copper, particulary the former; it alſo affords great Plenty of Wild Fowl, eſpecially Woodcocks in the Seaſon: It likewiſe yields great Quantities of Samphire, Eringo, fine Slate, and Marble; above all the reſt, vaſt Quantities of Fiſh, which are yearly exported to *France*, *Spain*, and other foreign Countries.

Market-Towns.

Lancaſter is the chief Town, *f*
Leſtard, *ſ*
Leſtwithiel, *f*
Truro, *w* and *f*
Bodmin, *ſ*
Helſton, *ſ*
Padſtow, *ſ*
Cachelford, *f*
Grampound, *ſ*
Penryn, *w*, *f*, and *ſ*
Tregony, *ſ*
St Ives, *w* and *f*
Penſance, *th*
Foway, *ſ*
St. German, *f*
St. Columbe, *th*
Falmouth, *th*
Market-jew, *th.*

Cum-

Cumberland

Is alſo a Maritime County, bounded Northward with *Scotland*, and Weſtward with the *Iriſh* Sea; it contains about 1040000 Acres, and is in Circumference 168 Miles; it is a fruitful Country, affording good Paſture on the Hills, and good Corn in Plenty in the Vallies: Fiſh and Wild Fowl are very plentiful, and Coals in Abundance; likewiſe large Mines of Lead and Copper, which are both very good in their Kind.

Market-Towns.

Carliſle is the chief, *ſ*
Cockermouth, *tu*
Whitehaven, *th*
Penrith, *tu*
Keſwick, *ſ*
Brampton, *tu*
Holm, *ſ*
Egermont, *ſ*
Kirke Oſwald, *th*
Longtown, *th*
Ravenglaſs, *ſ*
Wigtown, *tu.*

Derbyſhire

Is an Inland County, 130 Miles in Circumference, and contains about 680000 Acres, affords good Store of Corn and Wood, likewiſe conſiderable Quantities of Free-ſtone and Marble, Coal and Lead Mines in Abundance; alſo it yields Cryſtal and Alabaſter.

Market-Towns.

The County-Town is Derby, *ſ*
Cheſterfield, *ſ*
Workſworth, *tu*
Bolſover, *f*
Aſhburn, *ſ*
Alfreton, *m*
Bakewell, *m*
Dronsfield, *th*
Fiddlewall, *w.*

Devonſhire

Is a Maritime County about 200 Miles in Circumference, and contains near 1920000 Acres; it lies on the Weſt of *England*, and joins to *Cornwall*, having the Sea on the North and South; it affords great Plenty of Corn, Wool, Fowl and Fiſh, as alſo Lead and Tin Mines; but the principal Manufactures are Kerſies, Serges, and Lace.

Market-Towns.

Exon is the Capital, *w* and *ſ*
Barnſtaple, *f*
Honiton, *ſ*
Oakhampton, *f*
Plimpton, *ſ*
Taviſtock, *ſ*
Tiverton, *tu*
Plymouth, *m* and *tu*
Totneſs, *ſ*
Aſhburton, *ſ*
Biddiford, *tu.*
Torrington, *ſ*

Ax

Axminſter, *ſ*
Culliton, *th*
Dodbrook, *w*
Autrey, *tu*
Cudee, *ſ*
Hatherleo, *tu*
Moreton, *ſ*
Kinſbridge, *f*.

Dorſetſhire

Is a County exceeding pleaſant and fruitful, and lies upon the Channel, being 150 Miles in Circumference, and contains about 772000 Acres, yielding great Plenty of Corn, Cattle, Wool, Fiſh, and Wild Fowl; and it alſo affords Abundance of Hemp, Free-ſtone and Marble.

Market-Towns.

Dorcheſter is the County-Town, *ſ*
Weymouth, *tu* and *ſ*
Melcomb-Regis, *tu* and *f*
Shaftſbury, *ſ*
Pool, *m* and *tu*
Wareham, *ſ*
Corf-caſtle, *tu*
Cranborn, *w*
Blandford, *ſ*
Abbotſbury, *th*
Cerne, *w*
Frampton, *th*
Sherbourn, *tu* and *ſ*
Wimbourn, *f*
Sturminſter, *th*.

Durham

Is a County Palatine, and lies very far in the North of the Kingdom, the Air very cold, and the Ground not ſo fruitful as the Southern Parts: 'Tis 107 Miles in Circumference, and contains about 610000 Acres; its chief Commodities are Coal, Iron and Lead.

Market-Towns.

Durham is the principal, *ſ*
Aukland, *th*
Darlington, *m*
Sunderland, *ſ*
Bernard's Caſtle, *w*.

Eſſex

Is a County bounded by the Sea, and lies in the Eaſtern Part of *England*; is 146 Miles in Circumference, and contains 1240000 Acres; the Soil yields Plenty of Corn, Cattle and Wood: At *Wallden* it affords great Store of Saffron; and the beſt in the whole World, the *Spaniſh* being nothing in compariſon to it.

Market-Towns.

Colcheſter is the County-Town, *ſ*
Harwich, *tu*
Malden, *ſ*
Chelmsford, *f*
Barking, *ſ*
Hatfield, *ſ*
Rumford, *w*

Wallden, *ſ*
Epping, *th* and *f*
Braintree, *w*
Billericay, *tu*
Brentwood, *th*
Dunmore, *ſ*
Coggerſhall, *ſ*
Grayes, *th*
Halſtead, *f*
Hornden, *ſ*
Raleigh, *ſ*
Manningtree, *tu*
Waltham Abbey, *tu*
Troxtead, *f*
Sudbury, *ſ*.

Glouceſterſhire

Is a County exceeding fruitful and delightful; and taken all together, one of the pleaſanteſt Parts of the Kingdom: It contains about 800000 Acres, affords ſome of the beſt Cheeſe in the Nation, and Wool hardly inferior to *Spaniſh*. It alſo abounds in Wood, Iron, Steel, and Salmon; but its chiefeſt Manufacture is the Woollen, which is very extraordinary.

Market-Towns.

Glouceſter, the County Town, *w* and *f*
Cirenceſter, *m* and *f*
Tewkſbury, *f*
Blackley, *w*
Durſley, *th*
Camden, *w*
Newham, *f*
Stroud, *f*
Cheltenham, *th*
Lechlade, *tu*
Newent, *f*
Sudbury, *th*
Pauſwick, *tu*
Stow, *th*
Tedbury, *w*
Wickmore, *m*
Thornbury, *ſ*
Winchcomb, *ſ*
Wotton, *f*.

Hampſhire,

Or the County of *Southampton*, borders upon the Channel, being a pleaſant, healthful, and fruitful Country, about 100 Miles in Circumference, and contains about 1312500 Acres: It affords vaſt Plenty of Corn, Graſs, Sheep, and Wood, and particularly famous for Hogs and Honey, both of which are moſt excellent in their kind.

Market-Towns.

Southampton, the County Town, *tu* and *f*
Wincheſter, *w* and *ſ*
Portſmouth, *th* and *ſ*
Andover, *ſ*
Limington, *ſ*
Alton, *ſ*
Baſingſtoke,
Kinſclear, *tu*
Ringwood, *w*
Odiam, *ſ*
Rumſey, *f*
Alceſton, *th*.

Hertfordſhire

Is a very ſine inclos'd County, the Land ſomewhat ſtony, but yet very fruitful, affording great Plenty of Corn, and is very remarkable for good Malt; it is 130 Miles in Circuit, contains about 451023 Acres, and hath an excellent Air, *&c.*

Market-Towns.

Hertford is the County-Town, *ſ*
St. Albans, *ſ*
Barnet, *m*
Ware, *tu*
Barkhamſtead, *m*
Rickmanſworth, *ſ*
Hatfield, *th*
Buntingford, *m*
Baldock, *th*
Hitchin, *th*
Hodſdon, *th*
Stevenage, *f*
Tring, *f*
Watford, *tu*
Hempſted, *th.*

Herefordſhire

Is an Inland County of a good Soil, and healthful Air, 100 Miles in Circuit, and contains about 660000 Acres: It affords Plenty of Wool, Wheat, Salmon, and Cyder, which are generally eſtemed the beſt in the Kingdom.

Market-Towns.

Hereford is the Capital, *w*, *f*, *ſ*
Lempſte *f*
Weobly, *th*
Kyniton, *w*
Roſs, *th*
Pemb, *tu*
Ledbury, *tu*
Bromyard, *m.*

Huntingtonſhire

Is a ſmall Inland County of about 67 Miles in Circuit, and contains about 240000 Acres: It is an open Country, but generally very fertile and delightful, abounding in Corn and Cattle, which are its chiefeſt Commodities.

Market-Towns.

Huntington the chief, *ſ.*
St. Ives, *m*
Kimbolton, *f*
St. Neots, *th*
Ramſey, *w*
Yaxley, *tu.*

Kent

Is a Sea-County on the Eaſt part of the Channel; it is 160 Miles in Circumference, and contains about 1248000 Acres, being diſtinguiſhed into three Parts, *viz.* the Marſhy as *Romney* Marſh, *&c.* the Downs, and the Middle or Woody Part. It affords plenty of Corn, good Paſture, and the beſt Cherries and Pippins in the Kingdom.

Market-Towns.

Canterbury (famous for its Cathedral) is the Capital, *w* and *ſ*
Rocheſter, *f*
Maidſton, *th*
Dover, *w* and *ſ*
Sandwich, *w* and *ſ*
Romney, *th*
Smarden, *f*
Hithe, *ſ*
Bromley, *th*
Cranebrook, *ſ*
Cray, *w*
Dartford, *ſ*
Eltham, *m*
Feverſham, *w* and *ſ*
Folkſton, *th*
Graveſend, *w* and *ſ*
Lenham, *tu*
Lidd, *th*
Sevenoak, *ſ*
Tenterden, *f*
Malling, *ſ*
Milton, *ſ*
Tunbridge, *f*
Weſtram, *w*
Woolwich, *f*
Wrotham, *tu*
Wye, *th*.

Suſſex

Is a Maritime County, lying upon the Channel between *Kent* and *Hampſhire*, containing 1140000 Acres, and is 158 Miles in Circumference. The County is both fertile and healthful, and is moſt exceeding pleaſant; the South Downs being the moſt delectable or delightful Part of the whole Kingdom; and as I know them, I alledge them to have the moſt beautiful Variety, and the pleaſanteſt Proſpect that can be in the whole Culture of Nature; the Soil being exceeding rich, occaſioned by the numerous Flocks of Sheep there kept; and therefore produce wonderful Crops of Corn of all Sorts: It alſo hath the fineſt Woods and Rivers, and affords the beſt Game, of Hunting, Fiſhing, and Fowling.

Market-Towns.

Chicheſter is the chief, *w* and *ſ*
Eaſt-Grinſtead, *th*
Haſtings, *w* and *ſ*
Rye, *w* and *ſ*
Arundel, *w* and *ſ*
Horſham, *ſ*
Midhurſt, *th*
Steyning, *w*
Petworth, *w*
Battle, *th*
Hailſham, *ſ*
Bright-Helmſton, *th*
Cuckfield, *f*

Lancaſhire

Is a Sea-Coaſt County, bounded on the Eaſt by the *Iriſh* Sea; 'tis 170 Miles in Circuit, and contains 1150000 Acres; the Air is very wholeſome, and the People generally live to an advanced Age: The Soil is very good, and yields Corn of all Sorts, particulary Oats, which are looked upon as the beſt in the Kingdom: It affords alſo Plenty of Pit Coal, and great Quantities of excellent Fiſh of all Sorts.

Market-Towns.

Lancaſter is the County-Town, *ſ*
Clithero, *ſ*
Liverpool, *ſ*
Preſton, *w*, *f*, and *ſ*
Wigan, *m*, and *f*
Mancheſter, *ſ*
Warrington, *w*
Ulverſton, *th*
Bolton, *m*
Blackbourn, *m*
Cartmel, *m*
Coln, *w*
Bury, *th*
Charnley, *tu*
Dalton, *ſ*
Roachdale, *tu*
Howſtead, *m*
Hoſtingdon, *w*
Gariſtrong, *th*
Kirkham, *tu*
Hornby, *m*
Ormſkirk, *tu*
Poulton, *m*.

Leiceſterſhire

Is a fine pleaſant Inland County, 96 Miles in Circuit, contains about 560000 Acres, abounds in Corn and good Paſture, and is very remarkable for Beans and Peas for Horſes, which thrive there the beſt of any County in *England*; it is alſo eminent for large Sheep, which produce Abundance of Wool, and the longeſt in the Kingdom.

Market-Towns.

Leiceſter is the County-Town, *m* and *ſ*
Aſhby de la Zouch, *ſ*
Bolſworth, *w*
Harborough, *tu*
Hallaton, *th*
Hinkley, *m*
Lutterworth, *th*
Loughborough, *th*
Milton, *tu*
Mountſorrel, *m*
Waltham, *w* and *th*.

Lincolnſhire

Is a Maritime County, part bordering on the *German* Sea, and contains about 1740000 Acres, being 130 Miles in Circuit: The Weſtern Parts are good and fruitful, having Plenty of Graſs, and breed the largeſt Oxen in the Kingdom, but the Eaſtern Parts are marſhy, though well ſtored with Wild-fowl.

Market-Towns.

Lincoln is the Capital, *ſ*
Boſton, *w* and *ſ*
Grantham, *ſ*
Stamford, *m* and *f*
Grinſby, *w*
Gainſborough, *tu*
Bullingbrook, *tu*
Spalding, *tu*
Stanton, *m*
Binbrook, *w*
Alford, *tu*
Burton, *m*
Barton, *m*
Kirton, *th*
Bourn, *ſ*
Tatterſhall, *f*
Womsfleet, *ſ*
Dunnington, *ſ*
Falkingham, *th*
Holbeck, *th*
Horncaſtle, *ſ*
Louthe, *w* and *ſ*
Sleeford, *m*
Spilſby, *m*.

Middleſex

Is the Metropolis of the Kingdom, an Inland County, having the Soil fertile by Improvement, and the Air ſweet and wholſome as any in the Kingdom; the *Thames* that runs through it, parts it from the County of *Surry*, and is on all Accounts the fineſt River in the World.

Market-Towns.

London, the Metropolis, hath Markets for every Day in the Week.
Weſtminſter, *m*, *w* and *ſ*
Brentford, *th*
Stains, *f*
Uxbridge, *th*
Enfield, *ſ*
Edgworth, *th*.

Monmouthſhire

Lies upon the Borders of *Wales*, and formerly reckoned a Part of it, but now numbered among the *Engliſh* Counties: It is accommodated by the famous River *Severn*, the ſecond in the Kingdom; and contains 34000 Acres, being 80 Miles in Circuit. This County is healthful, abounding with Corn, Cattle, Salmon, and Trout.

Market-Towns.

Monmouth, the principal, *ſ*
Abergavenny, *tu*
Caerleon, *tu*
Chepſtow, *ſ*
Newport, *ſ*
Pontpool, *f*
Uſke, *m* and *f*.

Norfolk

Is a large County, bordering on the Northern Coaſt, upon the *German Sea:* 'tis 180 Miles in Circuit, and contains 1148000 Acres. The Soil is different, in ſome Places fertile, in others ſandy, and in ſome deep and heavy. Its principal Commodities are Corn, Wool, Honey, and ſome Saffron; but the chief of it are Stuffs and Herrings, the firſt from *Norwich* and the latter from *Yarmouth*. Sometimes Jet and Amber are found on the Sea Coaſt.

Market-Towns.

Norwich is the Capital, *w*, *f* and *ſ*
Lynn, *tu* and *ſ*
Yarmouth, *ſ*
Thetford, *ſ*
Attleborough, *th*
Aleſham, *ſ*
Buckingham, *ſ*
Burnham, *ſ*
Dearham, *f*
Walſingham, *f*
Downham, *ſ*
Walſham, *w*
Windham, *f*
Ropeham, *ſ*
Snaſham, *f*
Falkenham, *th*
Foulſham, *th*
Hingſham, *ſ*
Caſton, *tu*
Comer, *ſ*
Diſs, *f*
Harleſton, *w*
Herling, *tu*
Holt, *ſ*
Wotton, *w*
Worſted, *ſ*
Seby, *every Second* Monday.

Northamptonſhire

Is accounted one of the fineſt Inland Counties in the Kingdom; is 120 Miles in Circuit, and contains about 550000 Acres. The Air good, and the Soil rich; hath ſeveral fine Rivers, and abounds in Corn, Wood and Cattle.

Market-Towns.

Northampton, the County-Town, ſ
Peterborough, ſ
Brackley, *w*
Daventry, *w*
Oundle, ſ
Towceſter, ſ
Rothwell, *m*
Kettering, *f*
Wellinborough, *w*
Trapſtone, *tu*
Cliff, *tu.*

Northumberland

Is a Sea-County, bordering upon *Scotland*; in ſome Part the Air is ſharp, the Soil thin and barren; but towards the Sea it is tolerably fruitful. In this Country are Abundance of Lead and Coal Mines, from whence comes the Coals called Sea-Coals. Here are good Store of Wild-fowl, and Fiſh, particularly Salmon.

Market-Towns.

Newcaſtle is the chief Town, ſ
Berwick, ſ
Morpeth, *w*
Sexham, *tu*
Weller, *tu.*

Nottinghamſhire

Is an Inland County, in Circuit 110 Miles. and contains 560000 Acres: The Air is good and healthful, the Soil but indifferent (a great Part being Foreſt Ground) the South Part pretty fruitful, the Weſt woody, and yields Plenty of Pit-coal. The River *Trent* divides it from *Lincolnſhire.*

Market-Towns.

Nottingham is the County-Town, *w*, *f*, and ſ
Newark, *w*
Redford, *w*
Mansfield, *th*
Southwell, ſ
Bingham, *th*
Worſop, *w*
Tuxford in the Clay, *m.*

Oxfordſhire

Is one of the moſt pleaſant, healthful and fertile Counties in the Kingdom; 'Tis watered with delightful Rivers, as the *Thames*, the beautiful *Charrald*, &c. but above all, it is famous for having the fineſt Univerſity in the World, which conſiſts of 20 Colleges endowed, and five Halls not endowed, *viz.*

Founded, *Anno,*	Colleges.	By whom founded.
872	*Univerſity,*	by the Saxon King Alfred.
1262	*Baliol,*	by John Baliol, King of Scotland,
1274	*Merton,*	by Walter de Merton, Biſhop of Rocheſter.
1316	*Exeter,*	by Walter Stapleton, Bp. of Exeter.
1325	*Oriel,*	by King Edward II.
1340	*Queen's,*	by Robert Eglesford, B. D.
1375	*New,*	by William of Wickham, Biſhop of Wincheſter.
1427	*Lincoln,*	by Richard Flemming and Thomas Rotherham, Biſhops of Lincoln.
1437	*All-Souls,*	by Henry Chicheley, A.Bp. of Cant.
1459	*Magdalen,*	by William of Wainfleet, Biſhop of Wincheſter.
1511	*Brazen-Noſe,*	by William Smith, Biſhop of Lincoln. and Sir Richard Sutton, Kt.
1516	*Corpus-Chriſti,*	by Richard Fox, Bp. of Wincheſter.
1549	*Chriſt-Church,*	by King Henry VIII.
1555	*Trinity,*	by Sir Thomas Pope.
1557	*St. John's,*	by Sir Tho. White, Lord Mayor of London.
1571	*Jeſus,*	by Queen Elizabeth.
1609	*Wadham,*	by Nicholas Wadham, Eſq;
1620	*Pembroke,*	by Thomas Teſdale, Eſq; and Richard Whitwick, B. D.
1700	*Worceſter,*	by Sir Thomas Cooke.
1740	*Hartford,*	by Dr. Newton.

HALLS.

St. Edmonds St. Albans St. Mary's New-Inn Magdalen	belonging to	Queen's Merton Oriel New Magdalen	College.

Market-Towns in Oxfordſhire.

Oxford, the Capital, *w* and *ſ*
Woodſtock, *tu*
Banbury, *tu*
Burford, *ſ*
Henley, *th*
Watlington, *ſ*
Witney, *th*
Chipping Norton, *ſ*
Deddington, *ſ*
Biceſter, *f*
Bampton, *w*
Tame, *tu*
Charlbury, *ſ*.

Rutland,

Rutland

Is a ſmall Inland County, 40 Miles in Circumference containing about 110000 Acres; affords Plenty of Corn and Cattle, and is remarkable for the Redneſs of the Wool which the Sheep of that Country produce, occaſioned by the Colour of the Soil.

Market-Towns.

Oakhampton, *ſ*
Uppingham, *w.*

Shropſhire

Is a plentiful Inland County, the Air good, and ſo is the Soil; it is in Circuit 134 Miles, containing about 890000 Acres, and affords Plenty of Corn, Wood and Pit-coal, being accommodated by the River *Severn.*

Market-Towns.

Shrewſbury, the County-Town, *w, th,* and *ſ*
Biſhopſcaſtle, *f*
Bridgnorth, *ſ*
Ludlow, *m*
Wenlock, *m*
Elliſmere, *tu*
Whitchurch, *f*
Newport, *ſ*
Drayton, *w*
Wem, *th*
Church-ſtretton, *tu*
Oſweſtry, *m*
Shipton, *tu.*

Somerſetſhire

Is a large plentiful Sea-County in the Weſt of *England*, in Circumference 204 Miles, containing about 907500 Acres; it affords great Plenty of excellent Corn, and good Paſture, which feeds abundance of fine Cattle; and alſo yields Plenty of Lead, Copper, Chryſtal Stones, and Woad for Dyers: Its chief Manufactures are Cloth and Serges.

Market-Towns.

Briſtol is the Capital, *w* and *ſ*
Bath, *w* and *ſ*
Wells, *w* and *ſ*
Bridgewater, *th*
Ilcheſter, *w*
Taunton, *w* and *ſ*
Wincanton, *w*
Watchet, *ſ*
Southpetherton, *th*
Axbridge, *th*
Sheptonmallet, *f*
Somerton, *m*
Wellington, *tu*
Bruton, *ſ*
Ilminſter, *ſ*
Dunſtar, *ſ*
Wivelſcomb, *tu*
Caneſham, *th*
Crookhorn, *ſ*
Dulverton, *ſ*
Glaſtenbury, *tu*
Chard, *m*
Longport, *f*
Poutford, *tu*
Writon, *tu.*

Staffordſhire

Is an Inland County, containing about 810000 Acres, and is 141 Miles in Circuit; the Air is ſharp, but very healthful; the Soil different: Northward 'tis hilly and barren; but Southward it is fruitful and pleaſant, and affords Plenty of Corn, Graſs, Iron, and Pit-Coal; the middle Part is level, but ſomething woody: This County alſo affords good Stone, Marble, Alabaſter, and Lime-ſtone.

Market-Towns.

Stafford is the County-Town, ſ
Litchfield, *tu* and *f*
Newcaſtle, *m*
Burton, *th*
Penbridge, *tu*
Utuxetar, *w*
Eccleſhall, *f*
Ridgley, *tu*
Browley, *tu*
Breewood, *tu*
Walſhall, *tu*
Betley, *tu*
Locke, *w*
Tudbury, *tu*
Stow, *tu*
Wolverhampton, *w*.

Suffolk

Is a Sea-County, 140 Miles in Compaſs, and contains 995000 Acres; the Soil different, the beſt Part about *St. Edmondſbury*; it affords abundance of Cattle, and Butter of the beſt, but Cheeſe the worſt in *England*.

Market-Towns.

Ipſwich is the principal, *w*, *f*, and ſ
Dunwich, ſ
Orford, *m*
Alborough, ſ
Sudbury, ſ
Eye, ſ
Dedingham, *f*
Ixworth, *f*
Needham, *w*
Stowmarket, *th*
Newmarket, *th*
Beccles, ſ
Bury, *w*
Hadley, *m*
Framlington, ſ
Leſtoff, *w*
Neyland, *f*
Lavenham, *tu*
Mildenhall, *f*
Bildeſton, *w*
Clare, *f*
Bungay, *th*
Holſworth, *tu*
Mendleſham, *tu*
Woodbridge, *w*.

Surry

Is an Inland County, parted by the River of *Thames* from *Middleſex*: It contains about 592000 Acres, and is in Compaſs 112 Miles: The Country is plentiful, and the Air healthful; it is famous for Hunting and Horſe-racing: the principal Goods are Hats made in *Southwark* for Exportation.

Market-Towns.

Guilford is the County-Town, ſ
Rigate, *tu*
Southwark, *w* and ſ
Darking, *th*
Kingſton, ſ
Croydon, ſ
Farnham, *th*.

Warwickſhire

Is a pleaſant, healthful, and plentiful County, 155 Miles in Compaſs, and contains about 670000 Acres: The Soil, for the moſt part, is good and fertile; on the North a little woody: This County is remarkable for excellent Cheeſe, going by its Name.

Market-Towns.

Warwick is the County-town, *ſ*
Coventry, *f*
Stratford, *th*
Atherſtone, *tu*

Alceſter, *tu*
Birmingham, *th*
Coleſhill, *w*
Henley, *m*
Kyneton, *tu*

Nuneaton, *ſ*
Rugley, *ſ*
Southam, *m*
Suttoncolefield, *m.*

Weſtmoreland

Is a County in the North-weſt of *England*; is 120 Miles in Circuit, containing about 510000 Acres: This County abounds in Hills and Marſhes; and is not very plentiful but in ſome of the Vallies and Intervals, and towards the South.

Market-Towns.

Appleby is the County-town, *ſ*
Kendal, *ſ*

Longſdale, *th*
Burton, *tu*
Ambleſide, *w*

Kirbyſteven, *f*
Orton, *w*
Brough, *w.*

Wiltſhire

Is a fine Inland County, 140 Miles in Compaſs, and contains about 876000 Acres: In the Middle lies *Saliſbury-Plain*, very remarkable for its large Extent, and for feeding large Numbers of Sheep; and therefore Wool is the principal Commodity.

Market-Towns.

Saliſbury is the Capital, *w* and *ſ*
Hindon, *th*
Chippingham, *ſ*
Wilton, *w*
Marlborough, *ſ*
Malmſbury, *ſ*

Lavington, *w*
Wotton-baſſet, *th*
Cricklade, *ſ*
Deviſes, *th*
Dounton, *f*
Weſbury, *f*
Highworth, *w*

Calne, *tu*
Warminſter, [illegible]
Bradford, *m*
Amſbury, *f*
Auburn, *tu*
Swindon, *m*
Troubridge, *ſ.*

Worceſterſhire

Is a plentiful Inland County, 130 Miles in Circuit, and contains 540000 Acres: the Soil is, for the moſt part, good and fertile, affords Corn in great Plenty, and is very numerous in Cattle; it yields Plenty of Fiſh and Fruit. The Vale of *Eveſham* is juſtly eſteemed one of the moſt fertile Spots in the Kingdom.

Market-Towns.

Worceſter is the Capital, *w*, *f*, and *ſ*
Eveſham, *m*
Bewdley, *ſ*
Droitwich, *ſ*
Stowerbridge, *ſ*
Kidderminſter, *th*
Bromſgrove, *tu*
Parſhore, *tu*
Tidbury, *tu*
Upton, *th*
Shipton, *f.*

Yorkſhire

Is a Maritime County, and much the largeſt in all *England*; it is divided into three Parts, called *Ridings*, viz. *North*, *Eaſt*, and *Weſt*: 'Tis in general a plentiful County, abounding in Corn, Cattle, Fiſh, and Fowl, and famous for breeding fine Saddle Horſes. It is 320 Miles in Circumference, and contains 3770000 Acres; it ſends great Quantities of Woollen Cloth to *London*, and elſewhere, being its chiefeſt Manufacture.

Market-Towns.

York is the Capital; Market-Days *Thurſday* and *Saturday*, with 36 other Market-Towns, too numerous here to particularize.

The Principality of WALES.

WALES was originally independent of *England*, but in the Reign of King Henry the VIIth, it was incorporated with it. This Country is very mountainous and barren, except in the Vallies and Intervals, where it yields Plenty of Graſs and Corn. The Situation is Weſtward, bordering on the *Iriſh* Sea; the Air bleak and ſharp, but wholſome; the Cattle are numerous, but very ſmall; and on the Hills there are Goats in abundance. This Country is divided into North and South, *viz.*

North-Wales

Contains Angleſey, Carnarvonſhire, Denbighſhire, Flintſhire, Merionethſhire, and Montgomeryſhire.

Angleſey is an Iſland in the North-weſt Part of the Country, about 80 Miles in Compaſs, and contains about 200000 Acres. It affords Plenty of Corn, Cattle, Fiſh, Fowl, and Mill-ſtones (for grinding of Corn) in abundance: It has but two Market-Towns, *viz. Beaumaris* and *Newborough*; *Wedneſday* is the Market-Day of the firſt, and *Tueſday* of the latter.

Carnarvonſhire is a Sea-coaſt County, 110 Miles in Compaſs, containing about 340000 Acres. It hath Plenty of Corn, Cattle, Fiſh and Wood; the Air is healthful, and the Soil good, eſpecially the Weſtern Part, which produces abundance of excellent Barley.

Market-Towns.

Carnarvon is the Chief, *ſ*
Bangor, *w*
Krobich, *w*
Polbel, *w*
Aberconway, *f*
Newin, *ſ*.

Denbighſhire is 116 Miles in Circuit, and contains about 410000 Acres. The Middle of this County hath Plenty of Rye, Coals, and Sheep; it hath alſo ſome ſmall Lead Mines, but the chief Part of it is a Valley called *Diffryn Cluid*, exceeding pleaſant and fertile, adorned with ſeveral Gentlemen's Seats, and thoſe of good Eſtates. *Denbigh* is the County-Town, and the Market-Day on *Wedneſday*. *Wrexham* is another of its principal Market-Towns, a pretty Town, and famous for its Market, neat Church, and lofty Steeple.

Flintſhire contains about 160000 Acres, and is in Circuit 82 Miles. It hath but three Towns, *viz.* *Flint*, *St. Aſaph*, and *Gairus*; the firſt ſo ſmall, that it hath no Market. 'Tis a hilly Country, but the Vales are very fertile, and the Inhabitants commonly live to an advanced Age. Its Commodities are ſmall Cattle, Butter, Cheeſe, Pit-coal, Lead and Mill-ſtones. In this County is *St. Winefred's Well*, ſo famous for curing Aches, Lameneſs, and as ſome ſay, for Propagation.

Merionethſhire is 180 Miles in Circuit, and contains about 500000 Acres. The Country in general is mountainous, but yet not without Plenty of ſmall Cattle, and other Neceſſaries for the Inhabitants. The chief Manufacture is Cotton-Work. The principal Town is *Harlech*, which hath a pretty good Market on *Saturdays*.

Montgomeryſhire is in Compaſs 94 Miles, and contains 560000 Acres. 'Tis fruitful, though mountainous, and hath ſix ſmall Market-Towns, but no Manufactures worth Notice.

South-Wales

Contains Brecknockſhire, Cardiganſhire, Camarthanſhire, Glamorganſhire, Pembrokeſhire, and Radnorſhire.

Brecknockſhire is 106 Miles in Circuit, and contains about 620000 Acres, divided into Hills and Valleys; the firſt but barren, but the latter very plentiful, wholeſome, and pleaſant. *Brecknock* is the chief Town, and hath a good Trade for Clothing; it hath two good Markets in a Week, *viz. Wedneſdays* and *Saturdays.* The Commodities are Cattle, Fiſh, and ſome ſmall Quantity of Otters Furr.

Cardiganſhire is 94 Miles in Compaſs, and contains about 520000 Acres. It is ſituated on the Bank of the *Iriſh* Sea, and hath Plenty of Corn, Cattle, Fiſh, Fowl, *&c.* Of late Years it is become remarkable for its Silver, Copper and Lead Mines.

Carmarthenſhire is one of the moſt plentiful Counties in all *Wales*, the Air good, and the Soil fertile. It affords Plenty of Corn, Cattle, Salmon, Wood, Pit-coal, and the beſt Lead. 'Tis 120 Miles in Compaſs, containing about 700000 Acres.

Glamorganſhire is a very fine plentiful County; in the South Part it is ſo fruitful, that it is called the *Garden of Wales.* It is 112 Miles in Circuit, and contains about 540000 Acres. *Cardiff* is the County-Town, which keeps two Market-Days weekly, *viz. Wedneſday* and *Saturday.*

Pembrokeſhire is a very pleaſant and plentiful County, for the moſt part ſurrounded by the Sea. It is 93 Miles in Compaſs, and contains about 520000 Acres. This County is famous for a Harbour called *Milford-Haven*, which is juſtly eſtemed to be in all reſpects one of the beſt in the World. *Pembroke* is the principal Town, whoſe Market is kept on *Saturday.*

Radnorſhire is one of the moſt barren and unfruitful Counties in all *Wales.* It is in Circuit 90 Miles, and contains about 310000 Acres. The Aſſizes are uſually kept at *Preſtain*; but *Radnor* is the Shire-Town, and hath a tolerable Market upon *Saturday*, and *Preſtain* hath another on *Wedneſday.*

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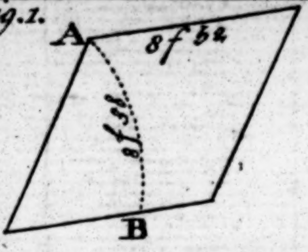
Fig. 1.



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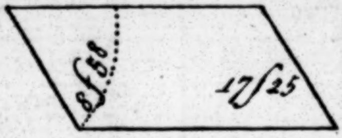

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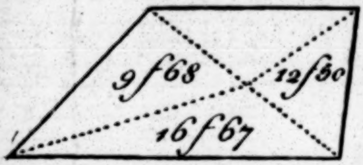

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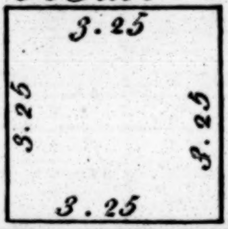

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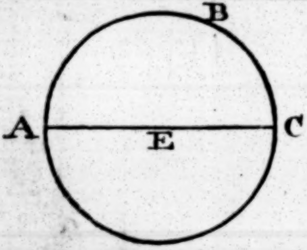

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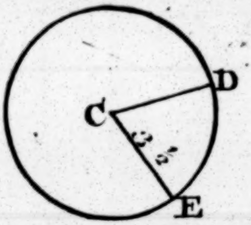

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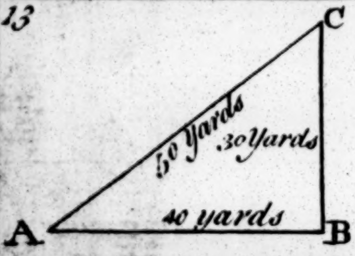

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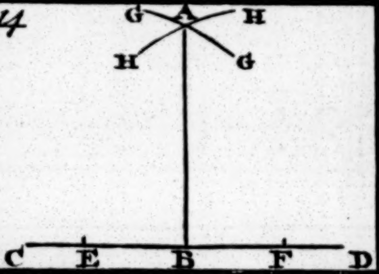

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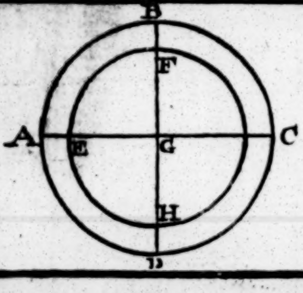

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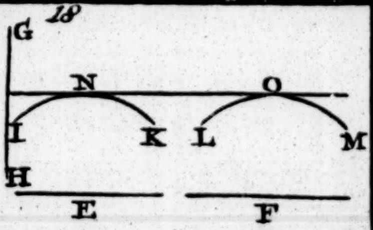

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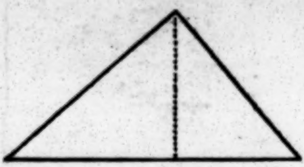

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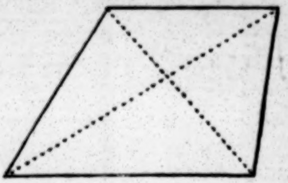

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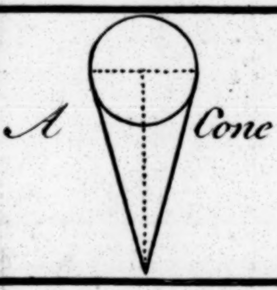

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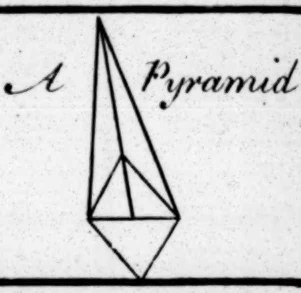

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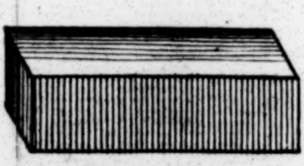

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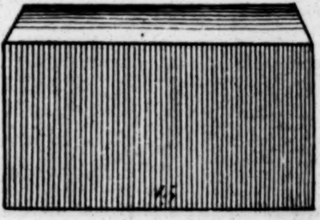

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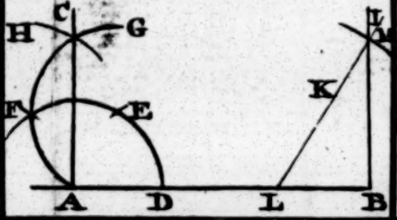

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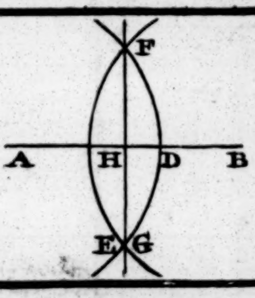

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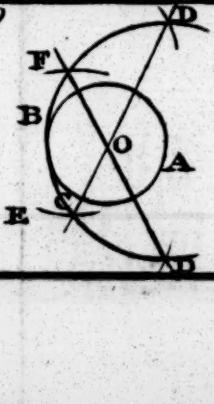

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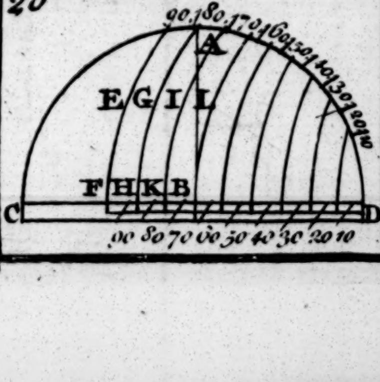

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THE *CARPENTER*'s PLAIN and EXACT RULE.

Of Menſuration of Plains and Solids.

THE ſeveral Kinds of Meaſuring are Three, *viz.*

1ſt, *Lineal*, by ſome called *Running Meaſure*, and is taken by a Line, and reſpects Length without Breadth; the Parts of which are,

12 Inches 1 Foot, 3 Feet 1 Yard, 16 Foot and half 1 Rod, Pole, or Perch.

All Kinds of Ornamental Work, ſuch as Cornice, Freeze, *&c.* are meaſured by *Running Meaſure.*

2dly, *Superficial*, or flat ſquare Meaſure, is that which reſpects Length and Breadth; and the Parts are, *viz.*

144 Inches 1 Foot, 72 Inches half a Foot, 36 Inches one quarter of a Foot, 18 Inches half a Quarter of a Foot, 272 Inches and a Quarter one Rod, 136 Foot half a Rod; 1296 Inches, or 9 Foot, one ſuperficial ſquare Yard,

3dly, *Solid*, or Cube Meaſure, which reſpects Length, Breadth, and Depth, or Thickneſs; and the Parts are, *viz.*

1728 Inches 1 Foot, 1296 Inches three quarters of a Foot, 864 Inches half a Foot 432 Inches one quarter of a Foot, and 27 Foot 1 ſolid Yard.

Superficial Meaſure.

TO meaſure Things that have Length and Breadth, ſuch as Board, Glaſs, Pavement, Wainſcot, and Land, is to take the Dimenſions of the Length and Breadth, according to the cuſtomary Method uſed in each Particular; as Board and Glaſs are meaſured by the Foot, but the Dimenſions are taken in Feet and Inches, and the Content given in Feet.

Wainſcot and Paving by the Yard, as are alſo Plaiſtering and Painting, and the Dimenſions are taken in Feet and Inches, and the Content given in Yards.

Dimenſions of Land are taken by the Pole, or Chain of 4 Poles in Length; all which is taken in ſquare Meaſure ſuperficial, that is, an Inch, Foot, Yard, or Pole; which is not only ſometimes in Length, but alſo as much in Breadth too; or if it wants of it one way, it muſt be made up the other.

Of the Square.

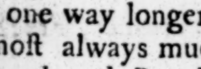
The ſquaring of any Number, is multiplying it into itſelf, as 12 Inches multiplied by 12 Inches, make 144 Inches ſquare, on the flat. The Square of any Thing is found four ſeveral Ways, *viz.* by whole Numbers, by Decimals, by Practice, and by croſs Multiplication; in each of which Methods I ſhall give Examples of Operation.

When any thing is to be meaſured, it muſt be conſidered what Form or Faſhion it is of; and then it muſt be meaſured according to the ſeveral Rules for each Figure.

Firſt, If it be a Square of equal or unequal Sides, that is, one way longer or wider than the other (as Boards are almoſt always much longer than they are broad,) then the Length and Breadth muſt be multiplied one by the other, which makes it ſquare Meaſure, as was hinted before; and if that Product be divided by its proper Diviſor, as 144 is the Diviſor for flat or ſuperficial Meaſure, and 1728 the Diviſor for Cube or ſolid Meaſure; the firſt being the ſquare Inches in a ſuperficial ſquare Foot, and the other the cubic ſquare Inches in a ſolid Foot ſquare.

Example.

Admit a Board be 12 Inches broad, and 8 Foot or 96 Inches long; how many ſquare ſuperficial Feet doth it contain?



96
12

144)1152(8 Foot.
1152

(0)

Here the Length in Inches is multiplied by the Breadth in Inches, and the Product 1152 divided by 144, the ſquare Inches in a Foot, quotes 8 Foot ſquare for the Contents of the Board.

A general Rule for Diſpatch.

If the Length of a Board, or Piece of Glaſs, be given in Feet, and the Breadth in Inches, multiply one by the other, (without any Reduction) and divide the Product by 12, and the Quotient will be the Anſwer in Feet, and the Remainder will be Parts of a Foot. So the foregoing Example might have been ſooner done by dividing 96 the Length, by 12 the Breadth, and it quotes 8 Foot for the Content, as by the former Way.

Example.

Suppoſe a Board be 14 Foot long, and 15 Inches broad; what's the Content in ſquare Feet?

14 Foot long.
15 Inches broad.

12) 210

Foot 17—$6\frac{6}{12}$ or $\frac{1}{2}$.

So the Anſwer is 17 Foot and $\frac{1}{2}$. And ſo for any other Example of this Kind.

Or conciſer thus,

14
by 1—3

14
3 In. $\frac{1}{4}$ $3\frac{2}{4}$ or $\frac{1}{2}$.

Anſwer $17\frac{1}{2}$.

Here 3 Inches is the $\frac{1}{4}$ of a Foot, wherefore $\frac{1}{4}$ of 14 is taken, and added to 14, and it makes 17 Foot and $\frac{2}{4}$, equal to $\frac{1}{2}$

If a Board be wider at one End than the other, then take the Breadth in the Middle, or add the Meaſure of both Ends together, and take the Half for the mean Breadth, which multiply by the Length?

Example.

Suppoſe a Board to be 120 Inches long, and the narroweſt End 10 Inches wide, the broadeſt End 34 Inches wide; what is its Content in ſuperficial Feet?

Add { 34 broadeſt End
10 narroweſt.

the 44
half —
is 22 the Medium.
120 the Length.

144) 2640 (18 Foot $\frac{1}{3}$ *Anſwer.*
144

1200
1152

Rem. $\frac{48}{144} \Big| \frac{4}{12} \Big| \frac{1}{3}$ or 4 Inches; 48 the Remainder is $\frac{1}{3}$ of 144.

Or thus:

Foot Inches
10——00 narroweſt End.
1——10 the mean Breadth.

In. 10——00
For 10 In. { $6\frac{1}{2}$ 5——00
$4\frac{1}{3}$ 3——04

18——04 *Anſwer.*

If a Board or Piece of Glaſs be ever ſo irregular, it may be meaſured very near, by taking the Breadth in 5 or 6 Places, and add the ſeveral Breadths together, dividing the Total by the Number of Places, and the Quotient will be the mean Breadth; which multiply by the Length, *&c.*

Having the Breadth in Inches of any Board, or Piece of Glaſs, to know how much in Length of that Board, or Piece of Glaſs, will make a Foot ſuperficial.

Rule Divide 144 by the Inches in Breadth, and the Quotient will be the Length of that Board that will make a Foot.

Example.

If a Board be 9 Inches broad, what Length of that Board will make a ſuperficial Foot?

Or by the Rule of Three Reverſe, thus,

9) 144

Inches 16 *Anſwer.*

I. b. *I. l.* *In.*

If 12 give 12, what 9 broad?

12

9) 144

Anſwer 16 Inches.

If a Board be 12 Foot ½ long, and 15 Inches broad; how many ſquare Feet doth it contain?

VULGARLY.

Inches.

150 long

15 broad.

750

15

144) 2250 (15 Foot.

144

810

720

90

Multiply by 12 Inch. 1 Foot.

144) 1080 (7 Inches.

1008

72

by (4 ¼ in an Inch.

144) 288 (2 ¼ or ½

288

...

DECIMALLY.

12,5

1,25

625

250

125

Foot 15,625

12

Inches 7,500

4

Quarters 2,000

By Croſs-Multiplication.

Feet. *In.*
12——6
1——3

12——0
0——6
3——1 $\frac{1}{2}$

Anſwer 15——7 $\frac{1}{2}$

By Practice.

Feet. *In.*
12——6
1——3

12——6
3 Inches $\frac{1}{4}$ 3——1 $\frac{1}{2}$

Facit 15——7 $\frac{1}{2}$

Here the Content is found four ſeveral Ways, *viz.* by multiplying the Inches together, and dividing by 144, *&c.* The next Work is performed decimally; the third Method is by Croſs-Multiplication; and the laſt and beſt is by Practice.

Any of theſe Methods may be eaſily underſtood by the Uſe of the Arithmetical Part of this Book, except the Method by Croſs-Multiplication, which, I think, hath not been ſhewn; wherefore I ſhall explain it here,

In the Example, 1 Foot 3, ſtands under 12 Foot 6; and having drawn a Line, ſay, once 12 is 12; then I ſay croſs-way, 6 times 1 is 6 Inches; ſo that Line is 0 Foot 6 Inches: Then croſs-way again, I ſay 3 times 12 is 36 Inches, the 12's in 36 is 3 times, or 3 Foot; ſo that Line is 3 Foot 0 Inches: Laſtly, I multiply the Inches together, ſaying, 3 times 6 is 18, the 12's in 18 once, and there remains 6, or $\frac{6}{12}$, equal to $\frac{1}{2}$, as in the Work.

Proper Directions for Joyner's, Painters, Glaſiers, &c.

Rooms being generally various in their Forms, take this general Rule in all Caſes, *viz.*

Take a Line, and apply one End of it to any Corner of the Room: Then meaſure the Room, going into every Corner with the Line, 'till you come to the Place where you firſt began: Then ſee how many Feet and Inches the String contains, and ſet it down for the Compaſs or Round; then take the Height by the ſame Method.

Glaſiers are to take the Depth and Breadth of their Work, and multiply one by the other, dividing by 144; Glaſs being meaſured as Board.

Having thus ſhewn the Methods of caſting up Dimenſions, I come now to Particulars; and the firſt of

Glaſiers Work, by the Foot.

If the Windows be ſquare, multiply the Length by the Breadth, which will produce the Content, as aboveſaid.

Examples.

A Window glazed by
Croſs Multiplication,
Foot. In.
8—9 high
7—3 broad
56—0
2—0
5—3
2¼
63—5¼

Foot. In.
8—9
7 Foot 3
61—3
3 Inches ¼ 2—2¼
63—5¼ *Anſwer.*

If the Windows are arched, or have a curved Form, no Allowance is made, by reaſon of the extraordinary Trouble, and Waſte of Time, Expence or Waſte of Glaſs, *&c.* And the Dimenſions are taken from the higheſt Part of the Arch, drawn to the Bottom of the Window, for the Height or Length; which multiply by the Breadth, and the Product will be the Anſwer in Feet, *&c.*

Glaſiers are often ſo very nice, as to take their Dimenſions, and to meaſure to a Quarter of an Inch.

Example.

Foot. In.
4—3½ long.
2 Foot 7¾ broad.

6 Inches is ½
1½ is ⅛
¼ is 1/48

8—7
2—1¾
6¼¾
1¼
11—4¼

Glaſs is meaſured by the Foot, as ſaid before; and the Price of Work is as follows; *viz.* *d.*
Engliſh Glaſs *per* Foot —— —— 0 5

	s. *d.*
French and Crown Glaſs	1—0
Common Work, Leading included, for every Foot ſquare	0—6
New Leading old Glaſs *per* Foot	0—3
Common Diamond Squares, each	0—1

Painters Work, by the Yard.

WHEN the Wainſcot of a Room is painted, you are to meaſure round the Room with a Line, (as hinted before) without girting the Mouldings, which are to be meaſured by a String, and added to the other; then multiply the Compaſs by the Height, with the Addition of the Mouldings, *&c.* and you have the Content in Feet and Inches; which reduced to Feet, bring into ſquare Yards by dividing by 9.

Example 1.

A Room painted,

Feet. In.
Being 45—8 in Compaſs, } What is the Content in ſquare
10 Foot 6 high : } Yards?

456—8
22-10

9) 479—6

Yards 53—2—6 *Anſwer.*

Example 2.

If the Height of a Room painted be 12 Foot 4, and the Compaſs 84 Foot 11; what ſquare Yards doth it contain? Anſwer, 116 Yards 3 Foot $3\frac{2}{3}$

Feet In.
84—11 Compaſs.
12 F. 4 high.

In. 1019—00
$4\frac{1}{3}$ 28—$03\frac{2}{3}$

9) 1047—$03\frac{2}{3}$

Yds 116—03—$3\frac{2}{3}$ *Anſ.*

Note, Double Work is allowed in Window-Shutters; Saſh-Frames and Mantlepieces are reckoned by themſelves, unleſs the Mantlepieces ſtand in the Wainſcot, and then they are to be meaſured as plain Work, deducting nothing for the Vacancy.

Prices.

Prices.	*s. d.*
Common coloured, 3 Coats in Oil, *per* Yard	0—6
On old Colour	0—4
Walnut-tree Colour	1—0
Marble Colour, from 16*d.* to	2—0
Saſh-Frames, each	1—0
Saſh-Lights, each	0—1
Window-Lights, one with another	0—3
Iron Caſements	0—3

Joiners Work.

WAINSCOTTING, the Dimenſions are taken as in Painting, *viz.* by meaſuring the Height (indenting the String where-ever the Plane goes, as well as the Painters do where-ever the Bruſh goes) and then the Compaſs; which multiply one into the other, dividing the Product by 9, and the Quotient is the Anſwer in ſquare Yards.

Example.

What is the Content of a Piece of Wainſcotting that is 9 Foot 3 long, and 6 Foot 6 broad?

Foot. In.
9—3
6 F. 6.

55—6
6 In. ½ 4—7½

9) 60—1½ (6 Yds ⅔ *Anſ.*
54

6

The Length and Breadth being multiplied together, brings it into ſquare Feet; which divided by 9, (the ſquare Feet in a Yard) produces 6 Yards ⅔ for the Anſwer, as *per* Margin.

By Croſs Multiplication, thus:

Feet. In.
9—3
6—6

54—0
4—6
1—6
1½

60—1½ as before, which divide by 9, *&c.*

Once more.

There is a Room wainſcotted, the Compaſs of which is 47 Foot 3 Inches, and the Height 7 Foot 6 Inches; what's the Content in Yards ſquare? *Anſwer* 39 Yards $\frac{1}{3}$.

Foot. In.
47—3 Compaſs.
7 F. 6 the Height.

330—9
6 In. $\frac{1}{2}$ 23 7$\frac{1}{2}$

9) 354—4$\frac{1}{2}$

Anſw. 39 Yds $\frac{3}{9}$ or $\frac{1}{3}$

Or thus,
Yds. In.
15—9
2 Yds. 6

31—6
6 In. $\frac{1}{2}$ 7·10$\frac{1}{2}$

Anſwer 39—4$\frac{1}{2}$

The Prices per Yard.

	s.	d.
For good Wainſcot — — —	6—	0
Wainſcotting, not finding Stuff, &c. — —	2—	0
Coarſe Wainſcotting — — —	1—	0
Deal Wainſcot, finding Stuff — —	3—	0
Not finding Stuff — — —	1—	6

Carpenter's Work.

ROOFING, Flooring, and Partitioning, the principal Carpentry in modern Building, are meaſured by the Square of 10 Feet each Way, that is 100 ſquare Feet.

For Roofing, multiply the Depth and half Depth, by the Front; or the Front and half Front by the Depth, and you'll have the Contents.

The Dimenſions are taken in Feet and Inches.

Example.

How many Squares doth that Piece of Work contain that meaſures 199 Feet 10 Inches in Length, and 10 Feet 7 Inches in Height? Anſwer 21 Squares 14 Feet 10 Inches $\frac{3}{4}$.

Operation.
Feet. In.
199—10 long.
10 F. 7 high.

1998—4
6 $\frac{1}{2}$ 99—11
1 $\frac{1}{12}$ 16—7$\frac{10}{12}$

21|14—10$\frac{10}{12}$ *Anſwer*, 21 Squares, 14 Feet 10 In. $\frac{10}{12}$.

This Work is done by cutting off two Places toward the Right Hand, and the Number on the Left are Squares, &c.

Again.

If a Floor be 49 Feet 7 Inches 4 Parts long, and 26 Feet 6 Inches broad; how many ſquare Feet?

The Operation by Croſs Multiplication.

Feet.	*In.*	*Parts.*
49	7	4
26	6	0
294	0	0
980	0	0
15	2	0
24	6	0
	3	6
	8	8
	0	2
13|14	8	4

Anſ. 13 Squ. 14 Feet, 8 Inch. 4 Pts.

Note, *In meaſuring Roofing, no Deduction is made for Sky-Lights, Chimney-Shafts,* &c.

In meaſuring Flooring, take the Dimenſions of the whole Floor at once in Feet, and then meaſure the Content in ſuperficial Feet of the Vacancy for the Stairs, Hearths, *&c.* which deduct from the whole Floor, and the Remainder is the true Content; which bring into Squares as before.

Note, *In Partitioning, you muſt meaſure the Doors, Door-caſes, and Windows by themſelves, and deduct their Content out of the Whole, except by Agreement they are included; and then you muſt mention in the written Agreement, Doors, Door-caſes, and Windows included.*

There are divers Sorts of Carpenters Work belonging to a Building, *viz.* Cantaliver-Cornice, Modilion-Cornice, Plain-Cornice, Guttering, Rail and Balluſters, Lintale, Pent-houſe-Cornice, Timber-front, Story, Breſt-ſommers, Shelving, Dreſſering, *&c.* all which are meaſured by Lineal or Running Meaſure. There are alſo Doors and Door-caſes, Lanthorn-Lights with their Ornaments, Balcony-Doors and Caſes, Cellar-Doors and Curbs, Columns and Pilaſters, Cupola's, *&c.* all which are valued by the Piece.

Carpenters Work is done at the following Prices, viz.

	l.	*s.*	*d.*
Flooring, finding Boards, the Square ---	1	15	0
Not finding Boards, from 2 *s.* 6 *d.* to ——	0	06	0

	l. s. d.
Roofing with Oak	2—00—0
Not finding Timber	0—12—0
Partitioning *per* Square	0—15—0
Not finding Timber	0—07—6
Stairs with Rails and Balluſters compleat	1—10—0
Sawing of Oak and Elm *per* 100 Foot	0—02—6
Fences for Trees	0—02—0

Oak Timber is commonly ſold for 40 *s.* *per* Tun (that is 40 Foot ſquare) in the Place; Aſh 30 *s.* and Elm 28 *s.* *per* Tun.

Note, *Carpenters meaſure the Timber Frames of any Building (which they call the Carcaſe) by the Square of* 10 *ſuperficial Meaſure, or* 100 *ſquare Feet, as hinted before.*

Bricklayers and Tylers Work.

Of Walling.

WALLING is meaſured by the Rod Statute-Meaſure, being 272 Feet and $\frac{1}{4}$ ſuperficial. The Method of taking their Dimenſions is thus: For a Wall round an Orchard or the like, they meaſure the Length by a Line, going over the Buttreſſes; and for the Height, they meaſure over the Mouldings (preſſing the Line into them) even to the Middle of the Coping: They likewiſe take Notice of the Thickneſs of the Wall, that is, how many half Bricks in Length the Wall is in Thickneſs; for three half Bricks, that is, a Brick in Length, and one in Freadth, is Standard Thickneſs: and all Walls, whether leſs or more, muſt be reduced to that Thickneſs, by this Rule, *viz.* Multiply the Product of the Length and Height, by the Number of half Bricks that the Wall is in Thickneſs; which Product divide by 3, and then the Quotient by 272 (the $\frac{1}{4}$ being generally neglected in Vulgar Working) and the Quotient will be Rods, at a Brick and half thick Standard Meaſure.

Example.

Admit the Face of the Wall meaſure 4085 Feet, and the Thickneſs be two Bricks and half, or five half Bricks thick, how many Rods doth it contain?

4085

```
          4085
             5
     ─────────
     3) 20425
     ─────────
272)  6808 (25 Rods, Anſwer.
     ─────────
          1368
          ────
           (8)
```

When the Work is wrought Decimally, then you divide by 272¼, or 272,25, which gives the Quotient ſomewhat leſs. But the Meaſuring of Brick-Work may be ſhorten'd by having the Rod of 16 Foot ½ centeſimally divided into 100 equal Parts, with which you take the Dimenſions, and the Length of the Wall in thoſe Rods; and 100 Parts multiplied by the Height, give the Content in Rods, of any Wall that is a Brick and half thick. Deduction muſt be made for Doors, Windows, *&c.*

A Table to reduce Brick-Work to Standard Meaſure, *i. e.* a Brick and half thick.

Brick			
1	Subtract	⅔	Reduces to a Brick and half.
2	Add	⅓	
3	Mult.	2	
4½		3	
5		4	

Example.

Suppoſe a Garden Wall to be 254 Foot round, and 12 Foot 7 Inches high, and three Bricks thick; how many Rods doth it contain?

```
              254
               12
            ─────
In.          3048
6½            127
1 1/12         21—2
            ───────
             3196—2
     ──────────────
272)  6392—4 (23, &c. Rods.
```

In this Operation, to Aggregate, or Total, is multiplied by 2, becauſe twice 3 is 6, the Number of half Bricks; and that reduces the Work to Standard Meaſure, as by the Table above.

Of

Of Chimnies.

This Brick-Work is commonly agreed for by the Hearth, and alſo ſometimes by the Rod; and the Method of taking Dimenſions is thus: If the Chimney ſtands ſingly, not leaning againſt, or being in a Wall, and worked upright over the Mantle-tree to the next Floor; it is girt about the Breaſt for the Length, and the Height of the Story is taken for the Breadth, and the Thickneſs of the Jaumbs for the Thickneſs. But if the Chimney ſtands againſt, or in a Wall, which is before meaſured with the reſt of the Building; then the Breadth of the Breaſt or Front, together with the Depth of the two Jaumbs, is the Length; the Height of the Story the Breadth, and the Thickneſs of the Jaumbs the Thickneſs. But if the Chimney ſtands in the Corner of a Room, and has no Jaumbs, then the Breadth of the Breaſt is the Breadth, the Height of the Story the Length, and the Thickneſs the Thickneſs. And for the Shaft, it is commonly girt in the ſmalleſt Part, for the Length; and the Thickneſs of both Sides, for the Thickneſs; in Conſideration of the Widths, Pargiting, Scaffolding, *&c.*

Note, *There is nothing to be deducted for the Vacancy between the Hearth and the Mantle-tree, becauſe of the Widths and the Thickening for the next Hearth above.*

Arches are meaſured by taking the Breadth and half the Breadth of the Arch, and add them together; and then to multiply the Total by the Length, for the Content in Thickneſs of the Arch.

Gable-Ends.

Take half the Perpendicular for the Breadth, and the Width of the Houſe for the Length; or half the Width of the Houſe for the Breadth, and the Perpendicular for the Length; which brings the Meaſure to an Oblong, which is eaſily meaſured by multiplying the Length by the Breadth, *&c.*

Note, *A Perpendicular is a down or upright Line in the Work thus* | *: There are ſeveral other Things in Bricklayers Work; as Cornice, Facias, Streight Arches, cheme Arches, Hips and Valleys in Tiling, and Water-Courſes: All which are meaſured by the Foot Lineal, or running Meaſure. Alſo Peers, Pilaſters, Ruſtick Work,* &c. *which are valued by the Piece.*

Prices	*l.*	*s*	*d.*	
For Walls, finding Materials ——	5—	00—	0	*per* Rod.
Not finding Materials ———————	1—	10—	0	ditto.

Prices.	*l. s. d.*	
For Tyling, finding Materials	1—05—0	*per* Square.
Not finding Materials	0—05—0	ditto.
For Tyling, finding Materials, (except Tiles) that is 15 Foot ſquare	0—10—0	*per* Rod.
For ſtripping without taking down	0—05—6	ditto.
With taking down	0—07—0	ditto.
For Pointing	0—02—0	ditto.

Paving.

Pavement for Cellars, Waſh-houſes, *&c.* is meaſured by the Square Yard.

Example.

If a Cellar, Waſh-houſe, or Court-yard be paved with Bricks, or pitched with Pebble, being 9 Yards 2 Foot long, and 6 Yards 2 Foot broad; how many Yards ſquare doth it contain? *Anſwer*, 64 Yards 1 and $\frac{1}{4}$ Feet, as by the following Work.

Yds. F.	*Yds. F.*
9—2	9—2
6—2	6 Yards 2
54—0	54—0
6—0	3—8
4—0	3—8
1$\frac{1}{4}$	
64—1$\frac{1}{4}$ *Anſ.*	64—1$\frac{1}{4}$

Foot.
29
20
9) 580
Yards 64$\frac{4}{9}$

Here the Anſwer is found by three different Operations, and the Reſult of each, to the ſame Amount, *viz.* by Croſs Multiplication, by Practice, *&c.*

Slating

Is valued by the Square of 10; in ſome Places by the Rod of 18 Foot ſquare; that is 36 ſquare Yards, or 324 Feet.

☞ In Tyling and Slating, where there are Gutters and Valleys, there is commonly an Allowance, which is to take the Length of the Roof all along upon the Ridge, which makes the Gutter double Meaſure; which in ſome Places is allowed, in others not. Sometimes there is an Addition for hollow Ware, that is, Ridge Tiles, Gutter Tiles, Corner and Dornmar Tiles; and here Cuſtoms differ: For in ſome Places they account one ſuperficial Foot for every Foot lineal or running Meaſure; then 100 Foot lineal is reckoned a Square. In other Places, for every 100 of ſuch Tiles they reckon one Square.

Plaſtering,

Is of two Kinds, *viz.* *Firſt,* Work lathed and plaſtered, ſometimes called Ceiling. *Secondly,* Plaſtering upon Brick-Work, or between the Quarters in Partitioning, by ſome called Rendering; both which are meaſured by the Yard ſquare, as the Joiners and Painters do. In taking Dimenſions of Ceiling, if the Room be wainſcotted, they conſider how far the Cornice bears into the Room, by putting up a Stick perpendicular to the Ceiling, cloſe to the Edge of the uppermoſt Part of the Cornice; and meaſure the Diſtance from the perpendicular Stick to the Wainſcot; twice which Diſtance muſt be deducted from the Length and Breadth of the Room taken upon the Floor, and the Remainder is the true Length and Breadth of the Ceiling: As ſuppoſe a Floor is 24 Foot long, and 18 Foot broad, and the Cornice ſhoots out 6 Inches; deduct a Foot for both Ends, and the Length of the Ceiling is 23 Feet; and the ſame for the Breadth; it leaves 17 Foot broad; which (if the Room be ſquare) multiplied together, the Content is 391 Foot, or 43 Yards and a half.

Example.

23 Feet the Length.
17 Feet broad.

161
23

9) 391 (43 Yards, 4 Foot.
36

31
27

4

If the Ceiling of a Room be 19 Foot 10 one way, and 17 Foot 6 the other, how many ſquare Yards does it contain?

By Croſs Multiplication, thus:

19 : 10
17 : 6

133
19
14 : 2
9 : 6
5

9) 347 : 1 (38 Yds. 5 Feet 1 Inch.

Example 2.

How many Yards ſquare are there in a Piece of Plaſtering that is 47 Foot 4 Inches 7 Parts long, and 18 Foot broad?

F. *I.* *Pts.*
47—4—7
3 and 6

142—1—9
6

9) 852—10—6 (94 Yds. 6 Feet, 10 Inch. 6 Parts. *Anſwer.*

In meaſuring Partitioning for Doors, Windows, and other Vacancies, there muſt be an Allowance or Deduction made, they being Deficiencies.

Prices per Yard.	*s.*	*d.*
For every Yard of common Plaſtering, finding Laths, Nails, *&c.*	0	9
Not finding Laths	0	4 ½
For White-waſhing with Size	0	1 ½
Partitioning finding all Materials	0	8

Maſons Work.

THE Maſons Work, conſiſting of Stone, is of two Sorts, *viz.* Superficial and Solid. Pavement, and the Face of Stone Walls, Houſes, *&c.* are meaſured as Brick-work. If the Work have Ornaments, as Capitals, Pilaſters, Rails and Balluſters, *&c.* then they are valued by the Piece.

	s.	*d.*
For every Foot of Plain Work in Walls, *&c.*	0	8
For Plain Cornice, about	1	5

	s.	*d.*
For rough Stone Wall, with Lime, 16 Foot ½ long, and 1 Foot high, *per* Rod	1	2
Without Lime, *per* Rod	0	3
Paving, digging the Stone, and all Workmanſhip, *per* ſquare Foot	0	3

Prices of Stone and Urns.

Rough Paving 1 *d. per* Foot; Rough Aſher, or Coping, 1 *d.* ½ *per* Foot; Fine Aſher 3 *d. per* Foot; Baſe *per* Foot 4 *d.* Carbe *per* Foot 6 *d.* Urns 3 Foot high 1 *l.* 4 Foot high 1 *l.* 10 *s.* 5 Foot high 2 *l.* and 6 Foot high 3 *l.*

Land Meaſure.

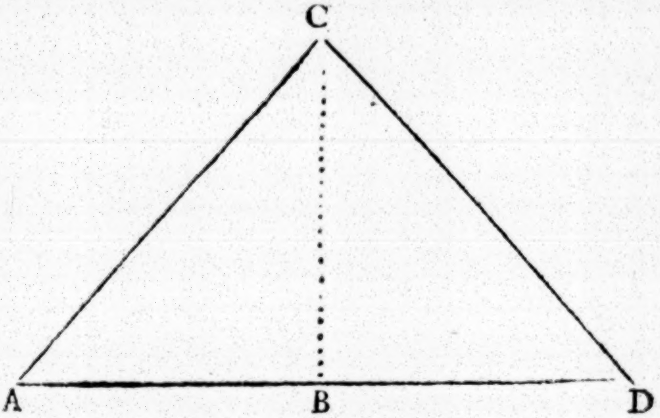
LAND is uſually meaſured by the Acre. The Dimenſions are taken with a Chain of four Poles in Length, and is divided into 100 Parts, called *Links*, whereof 10 ſquare Chains make an Acre. Let them be 10 in Length, and 1 in Breadth, or 5 in Length and 2 in Breadth, *&c.* or 160 ſquare Poles; but to find its Content (if not regularly ſquare) it is generally contrived into Triangles, as a Piece of Land of 4 Sides (if not ſquare) may be contrived into 2 Triangles, and Pieces of 5 Sides 3, and a 6 ſided Piece into 4 Triangles.

To meaſure a Triangle.

Admit the longeſt Side of the following Triangle, *viz.* A D to be 76 Poles in Length, and the Perpendicular or dotted Line B C to be 30 Poles; multiply 76 (the Baſe) by 15, the half of the Perpendicular B C, and it produces 1140: Or if you multiply the whole Perpendicular by half the Baſe (or longeſt Side) it will produce the ſame; which divided by 160, the ſquare Poles in an Acre) the Quotient gives the Content of that Piece of Land in Acres; and what remains multiply by 40, and divide by the ſame Diviſor, and it quotes Roods, *&c.*

Note, *Always the Perpendicular is drawn from the next oppoſite Angle to the Baſe, or longeſt Side, as in the following Figure.*

The



The Operation.

76 The Baſe.
15 Half the Perpendicular.

16|0) 114|0 (7 Acres, $\frac{2}{16}$, or $\frac{1}{8}$.
112|0

2|0

All other Pieces of Land (for the moſt part) muſt be brought into Triangles, and ſo meaſured, and their Contents added together.

Example.

Suppoſe a Plat of Ground contains 35 Poles broad, and 185 Poles long; how many Acres is the Content?

Rule.

Multiply the Length in Poles by the Breadth into ditto, and divide the Product by 160, (the ſquare Poles in an Acre) and the Quotient will be the Anſwer in Acres; and if any thing remains, divide again, either

$$\text{By} \left\{ \begin{matrix} 120 \\ 80 \\ 40 \end{matrix} \right\} \text{and the Quotient is} \left\{ \begin{matrix} \frac{3}{4} \\ \frac{1}{2} \\ \frac{1}{4} \end{matrix} \right\} \text{of an Acre.}$$

The Work.

185 the Length.
35 Poles the Breadth.

925
555

16|0) 647|5(40 Acres.
64

4|0) 75 Remains 1 Quarter.
4

35 Poles remain.

The Content is 40 Acres, $\frac{1}{4}$, and 35 Poles, or almoſt 40 Acres and an half.

The Four Pole Chain.

Example. There is a Plat of Ground that contains 16 Chains and 25 Links in Breadth, and 57 Chains and 30 Links in Length; what is the Content of that Piece of Land?

C. Link.
57,30 Length.
16,25 Breadth.

28650
11460
34380
5730

Acres 93| 11250 cut off 5 Places.
4

No Roods, 45000
40

Poles 18|00000 (93 Ac. 0 Rod, 18 Poles. *Anſ.*

Note, 4 Roods or Rods is 1 Acre, 40 Poles 1 Rood or Rod, 1 Rood or Rod 1 Quarter of an Acre.

Note alſo, *Gunter*'s Chain contains 4 Statute Poles in 100 Links, ſo that any Number of Chains are no more than ſo many 100 Links, as 4 Chains are 400 Links, and 6 Chains 600 Links, *&c.* 160 Statute Poles are an Acre, each Pole being 16 Foot and half; therefore, in a ſquare Chain there are 16 ſquare Poles; and if you divide 160 (the ſquare Poles in an Acre) by 16, (the ſquare Poles in a Chain) the Quotient is 10, the ſquare Chains in an Acre.

A ſquare Chain contains 10000 ſquare Links, (or 100 multiplied by 100) and therefore it follows conſequently, that an Acre contains 100000 ſquare Links.

To reduce Statute to Cuſtomary Meaſure.

According to a Statute made in the 33d of *Edward* the Firſt, and another in the 25th of Queen *Elizabeth*, a Statute Pole is 16 Foot and half long, (as ſaid before) but in divers Parts of *England* there are uſed Poles of 18, others of 21, and ſome of 24 Foot long, called Cuſtomary Meaſure, being in Uſe according to the Humour or Cuſtom of the Place where they are taken. To turn therefore one ſort of Meaſure into the other, admit Statute Meaſure to be turned into Cuſtomary, do thus: Multiply the Number of Acres, Roods, and Poles Statute Meaſure, by the ſquare half Yards, or ſquare half Feet in a ſquare Pole of Statute Meaſure, and divide the Product by the ſquare half Yards, or ſquare half Feet contained in the Pole of the Meaſure Cuſtomary, and the Quotient gives the Anſwer in the latter, in Acres, Roods, *&c.*

Example. In 272 Acres Statute Meaſure, how many Acres of 18 Foot to the Pole or Perch !

Acres.
172 Statute Meaſure.
121 half Yards in a Statute Pole.

Product 20812 (144 Acres $\frac{76}{144}$ *Cuſtomary Meaſure.*
144

&c.

In a Statute Pole are 11 half Yards, which ſquared make 121 ſquare half Yards; and in a ſquare Pole of 18 Feet are 144 ſquare half Yards, *&c.* For the Remainder, work as before, *viz.* by multiplying it by 4, *&c.* and the next Remainder by 40, *&c.* as ſpoke to before: ſo that the Anſwer is, that 172 Acres Statute Meaſure make, by the foregoing Operation and Direction, 144 Acres 2 Roods, and 4 Poles Cuſtomary Meaſure, of 18 Foot to the Pole.

One Example more per Contra.

In 543 Cuſtomary Acres of 18 Foot to the Pole, how many Acres of Statute Meaſure, being 16 Foot and half to the Pole?

```
         543 Cuſtomary.
         144 Square half Yards in a Cuſtomary Acre.
        ----
        2172
       2172
       543
      ------
121) 78192 (646 Statute Acres.
      796
      ---
       55, &c.
```

The Remainder 26 multiplied by 4, produces 104, which are not a Rood; which multiplied by 40 gives 4160; which divided by 121, quotes 34 Perches, and 46 remains. So the Anſwer is, that 543 Cuſtomary Acres, of 18 Foot to the Pole, makes 646 Acres or Roods, and 34 Poles, $\frac{46}{121}$ of a Pole.

Note, Cuſtomary Acres, as well as Statute Acres, contain 160 ſquare Poles or Perches; the Exceſs of Bigneſs is by the Bigneſs of the Pole.

Solid Meaſure,

IS that of Timber, Stone, Digging, and Liquids; and the Rule ſor Working is to multiply the Length and Breadth together, and then that Product by the Depth or Thickneſs, and the laſt Product will be the Content in Cubick Inches, which, if Timber or Stone, divide by 1728, (the Cubick Inches in a Foot ſolid) and the Quotient gives the Content in ſolid Feet.

Example. If a Tree be 16 Foot long, and 18 Inches ſquare; how many ſolid Feet doth it contain?

```
Multip. { 18              16
        { 18              12
          ---             ---
          324             192 the Length.
                          324 Breadth and Thickneſs.
                          ---
                          768
                         384
                        576
                        -----
                 1728) 62208 (36 Feet
                        5184
                        -----
                        10368
                        -----
```

	Decimally.	By Practice.
Square	1,5	1—6
	1,5	1—6
	225 Breadth	1—6
	16 Length	6 In. ½ 9
	36,00 *Anſwer.*	2—3
		4 and 4
		9—0
		Foot 36—0 *Anſwer.*

Solid Feet.

Note, 40 of round } Timber is a Tun or Load.
50 of hewn }

Diviſors.
1728 for Timber or Stone.
27 for Digging.
282 for Beer.
231 for Wine.

Example 2.

Suppoſe there is given a ſquare Piece of Timber, whoſe Breadth is 2,25, and Thickneſs 1,64 Feet, and Length 36,5 Feet, how many ſolid Feet are contained therein?

2,25 Breadth.
1,64 Thickneſs.

900
1350
225

36900
36,5 Length.

184500
221400
110700

134,68500 *Anſwer* 134 ſolid Feet.

The common Way of taking $\frac{3}{4}$ of the Compaſs for the true Square of it is erroneous, and gives the Solidity ſomewhat leſs than the true Content: but the true Way is to multiply half the Diameter by half the Compaſs, and then that Product multiply by the Length, which divide by 1728, and the Quotient is the Content. If you cannot come to meaſure the End of the Piece, you may know the Diameter by this Proportion, *viz* as 22 is to 7, ſo is the Compaſs to the Diameter. Or you may find the Square of a round Piece of Timber by this Rule, *viz.* multiply by the Inches of the Compaſs, and cut off 4 Figures to the Right-hand.

2821
Inch. 66 the Compaſs.
———
16926
16926
———
18|6186 *Anſw.* 18 Inches.
———
10000

Having the Breadth and Depth of a Piece of Timber or Stone, to know how much in Length of it will make a ſolid Foot; multiply one by the other, and let it be a Diviſor to 1728, thus:

Inches.
24 broad
18 thick
———
192
24
———
432) 1728 (4 Inches in Length, *Anſwer.*
1728

And thus you may make a Table to ſerve all Breadths and Depths, by which, much Labour may be ſaved in multiplying and dividing, and yet meaſure any Piece of Timber thereby very exactly.

The uſual Way for tapering Timber, is by this Method, *viz.* take the Dimenſions in the Middle, and multiply that by the Length; which, though ſomewhat falſe, yet, if done at ſeveral Lengths, as at every 5 or 6 Feet, it will be very near.

Digging,

IS meaſured by the ſolid Yard of 27 Foot; that is, 3 times 3 is 9, and 3 times 9 is 27 by which are meaſured Vaults, Cellars, Clay for Bricks, *&c.* Other Things are meaſured by the Flore of 324 ſolid Feet.

Example.

If a Vault or Cellar be digged 9 Foot deep, 4 Foot $\frac{1}{2}$ long, and 3 Foot 9 Inches broad; what is its Content in ſolid Yards?

Foot.
4 $\frac{1}{2}$ long
9 deep
40 $\frac{1}{2}$
3 *F.* 9 broad
121 $\frac{1}{2}$
6 Inches $\frac{1}{2}$ 20 $\frac{1}{4}$
3 $\frac{1}{2}$ of 6 10
27) 151 $\frac{3}{4}$ (5 Yards 16 Foot $\frac{3}{4}$.
(16)

Example 2.

How many Yards of Digging will there be in a Vault that is 25 *F.* 4 long, 15 *F.* 8 broad, and 7 *F.* $\frac{1}{2}$ deep. *per* 3 and 5 *F.* 8.

25—4
3
76—0
5
380—0
8—5 $\frac{1}{3}$
8—5 $\frac{1}{3}$
396—10 $\frac{2}{3}$
7 $\frac{1}{2}$
2778—2 2
198—5 1
Yd. *F.* *In.*
27) 2976—8 0 (110—6—8
27
06

Example.

There is a Mote that is 648 Foot long, 24 Foot broad, and 9 Foot deep; how many Flores?

```
                 648 long
                  24 broad
                ----
                2592
               1296
                ----
               15552
                   9
                ----
divide by 324) 139968 (432 Flores; Anſwer.
```

&c.

(o)

Solid Bodies being frequently painted, it is neceſſary to know how to find their Superficiality: To find the Superficial Content of a Square, or many-ſided or round Pillar; multiply the Sum of the Sides or Circumference by the Height in Feet; and the Product divided by 9, the Quotient will be all ſquare Yards.

Of a Globe.

Multiply the Circumference in Feet by itſelf, and then that Product by this Decimal ,0354, and this laſt Product will be the Content in Yards.

Note, A ſolid Yard ſquare of Clay will make about 7 or 800 Bricks; and the Price of making is 7 or 8 *s.* a Thouſand, 3 Bags (or Buſhels) and half of Lime, and half a Load of Sand, to laying 1000 Bricks.

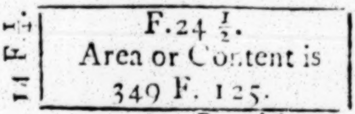
500 Bricks } make a Load.
1000 Plain Tiles }
25 Bags 1 *C.* of Lime.

IT may not here be improper, as well for refreſhing the Memory, as for improving the Underſtanding, and forming the Mind with proper Notions and Ideas of Meaſuring, to give a ſhort Repetition by demonſtrative Geometrical Figures, to explain what hath been verbally and arithmetically before expreſſed.

And firſt for *Planometry*, or *ſuperficial* or *flat Meaſure*; ſome of which is meaſured by the Foot Square; as are Boards, Glaſs, Marble, Freeſtone and Pavements. The Dimenſions are taken in Feet and Inches, and the Content given in ſquare Feet.

Example 1.

Suppoſe there is an Oblong, or long Square, let it be Board, Glaſs, or Pavement, *&c.* that contains on the longeſt Side (or the Length) 24 Feet and half, and the ſhorteſt Side (or Breadth) 14 Foot $\frac{1}{4}$, as in the following Figure, *viz.*



14,25 Breadth.
24,5 Length

7125
5700
2850

349,125

Rule. Multiply the Length by the Breadth, and cut off as many Places to the Right hand as there are Decimals in the Length and Breadth.

Example 2.

Suppoſe a Board or Piece of Glaſs be in the Form of *Figure the Firſt*, called a Rhombus, that is in the Shape of a common Pane of Glaſs, or Diamond ſquare.

Rule. To meaſure which, multiply the Breadth, *A. B*, by the Length of any of the Sides, (for they are all equal) and cut off as many Places to the Right-hand as there are Decimal Places in both Multiplicand and Multiplier, as hinted before: As ſuppoſe the Breadth *A B*, 8 Foot, 38 Parts, and the Length of the Side to be 8 Foot, 52 Parts; then the Work will appear thus:

F P.
8,52
8,38
6816
2556
6816
71,3976

Here the Multiplication is as in whole Numbers, and the Content or Anſwer is found to be 71 ſquare Feet, and $\frac{3976}{10000}$ ten Thouſandths of a Foot, or 4 Inches $\frac{1}{4}$.

3976 is ſeparated by a Comma, as above directed, and are ſo many 10000 Parts of a Foot, as in the Work and Margin expreſſed.

Example 3.

Again, admit a Piece of Meaſurement to be of the Form of *Figure the Second*, called a Rhomboides; its Length 17 Foot 25 Parts, and its Breadth 8 Foot 58 Parts.

F. P.
17,25 Length.
8,58 Breadth.
————
13800
8625
13800
————
148,0050

The fore-mentioned Figure hath its oppoſite Sides equal, and its oppoſite Angles alike.

Anſwer, the Content is 148 Feet.

Once more.

Suppoſe a Board, Piece of Glaſs, Pavement, or Piece of Land, to repreſent, or be in the Form of a Triangle, or three-corner'd Figure, expreſſed as in the Shape of *Figure the Third*. Every Triangle is half a long Square, whoſe Length and Breadth is equal to the Perpendicular and Baſe.

Note, The dotted Line is the Perpendicular, the bottom Line the Baſe, and the Line from the Top of the Perpendicular to the left Angle of the Baſe, is called the Hypotheneuſe.

The meaſuring of a Triangle hath been already ſhewn, and therefore I ſhall deſiſt ſpeaking any further thereto.

The *Fourth Figure* is called a Trapezium, and conſiſts of 4 Sides: This Figure, before it can be meaſured, muſt be divided into two Triangles, thus; *viz.* by 2 Lines drawn from one Angle or Corner, to the Angle oppoſite to it, as in the Figure.

Example 4.

Suppoſe the Dimenſions of the Trapezium before deſcribed to be, *viz.* the Baſe 16 *F.* 76; the one Perpendicular 12 *F.* 50, and the other 9 *F.* 68 (as in Figure 5) what's the Content?

The Operation.

	F. P.	
One Perpendicular	12,50	} add
The other	9,68	}
The ſum is	22,18	
The half Sum is	11,9, which	
multiply by the whole Baſe	86,67	
produces	184,8703	

which is 184 Feet, and $\frac{8703}{10000}$ of a Foot, equal to 10 Inches and half.

Note, If two Sides of a Trapezium are parallel, that is, the Lines equal; then add them together, and half the Sum multiplied by the neareſt Diſtance between thoſe two Sides, give the Content. Or if you meaſure it in the Middle between thoſe two Sides or Lines that are of equal Length, the Anſwer will be the ſame.

Note alſo, Painting, Plaſtering, or any other irregular Pieces of Meaſurement, if in the Form of a Triangle, or if not, if divided as above, may be meaſured *ut ſupra*; and brought into Yards (if the Content is to be ſo given in) by dividing by 9, as before ſhewn.

Glazier's Work.

It may be done thus; Multiply the Length in Inches and Parts, by the Breadth in Inches and Parts, and ſeparate for the Decimals (if any) as before ſhewn.

Example.

In. Pts.
A Piece of Glaſing 29,5 long
and 7,0 broad

144) 206,50 (1,5
144

12) 62 (5
60

(2)

So the Content is 1 *F.* 5, and $\frac{1}{6}$ of an Inch.

Here, after the two Places are ſeparated by a Comma, the Remainder is divided by 144, and then what remains by 12, *&c.*

Or thus, as if Shillings and Pence.

s. *d.*
2—5 $\frac{1}{4}$
7
F. *I.*
12) 17—0 $\frac{3}{4}$ (1 5 $\frac{3}{4}$ Anſwer.

An Expeditious Way.

When the Length of any Superficies, either of Board or Glaſs, is given in Feet, and the Breadth in Inches, then only multiply the one by the other, and divide by 12, and the Quotient will be the Anſwer in Feet, and the Re-

Remainder will be the Parts of a Foot; as hath been ſpoken of before.

Example.

Admit a Board to be 15 Foot long, and 12 In. broad.
12 Inches broad.

---

12) 180 (15 Foot Anſwer.

Of Regular Figures.

THERE are four Kinds, namely the Pentagon of five Sides, the Hexagon of ſix, the Heptagon of ſeven, and the Octogon of eight Sides; all which derive their Names from the *Greek*.

To meaſure any of theſe Bodies, is by dividing them into Triangles; which is done by drawing Lines from the Centre of the Figure to every Angle or Corner; then from the Centre to the Middle of any of the Triangle Sides, draw a Line; which Line is the Perpendicular. Having the Perpendicular and Baſe of any of theſe Triangles, find the Content of one Triangle, and that multiplied by the Number of Triangles, finds the Content of the Body, or Figure.

Note, *To find the Centre or Middle of any Regular Figure of an even Number of Sides, draw a Line from one Angle or Corner to its oppoſite, the Middle of which is the Centre*; *but if your Figure have any odd Number of Sides, as* 5 *or* 7, &c. *draw a Line from any Angle to the Middle of the Side oppoſite, the Middle of which Side is the Centre.*

Of Solid Meaſure.

SOlid or Cube Meaſure hath been already defined, (as well as Superficial Meaſure) ſome of the Figures of which are number'd, 6, 7, and 8.

To meaſure a Solid in form of a Cube, which hath Length, Breadth, and Thickneſs all equal, you muſt multiply theſe into themſelves; and the laſt Product gives the Solidity or Content, either of Wood or Stone. A Cube hath ſix Sides, and is in Shape like a Dye.

Example on the Cone, Decimally without dividing by 1728.

2,5 } the Diameter.
2,5 }
———
12,5
50
———
6,25 the Square of ditto.
,785
———
3125, &c.
———
4,90625
3,5 the $\frac{1}{3}$ of the Altitude.
———
2453125, &c.
———
17,171875 the Content in ſolid Feet.
———

The Cone is meaſured by multiplying the ſuperficial Inches at the Bottom or Baſe thereof; the Product whereof multiply by one third of the Inches in the Length, and that Product is the ſolid Quantity in Inches; which Inches divided by 1728, and the Quotient gives the Anſwer in ſolid Feet

This Method may ſerve for Tapering Timber, or of any other Thing of the Shape repreſented in Figure 7, *viz.* that of a Sugar-Loaf.

To meaſure the Pyramid.

Rule. Multiply the Side of the Baſe or Bottom into itſelf, and that Product by one Third of the perpendicular Height, and the laſt Product will be the Content in ſolid Feet: Or one third Part of the Area at the Baſe, multiplied by the whole Altitude, gives the Content alſo.

Examples of both Ways.

Suppoſe there is given a ſquare Pyramid (or Figure like a Spire Steeple) the Side of whoſe Baſe is 4 Foot and half, and the perpendicular Height 18 Feet; what is the ſolid Content?

4,5
4,5
———
225
180
———
20,25
6 $\frac{1}{3}$ of the
——— Altitude.
121,50 *Anſwer* 121 Feet and ,50 or $\frac{1}{2}$
———

6,75 $\frac{1}{3}$ of 20,25 the Area at the Baſe
18 the whole Height.
———
5400
675
———
121,50 Anſwer 121,50 as before.

When one Side of the Baſe is longer than the other, as admit one to be 2 *F.* $\frac{1}{2}$, and the other 1 *F.* $\frac{1}{2}$; then multiply the Length of the Baſe by the Breadth, and that Product by one third of the Height, as before.

To meaſure the Fruſtum or Segment, i. e. *a Piece or Part of a Pyramid or Cone.*

Rule. Suppoſe the whole Content to be(as above) 121,50; then the Segment being meaſured by itſelf, gives 56,25; which ſubtract from 121,5 and the Remainder will be the Content of the Fruſtum, thus:

121,5
56,25
———
65,25

So that the Content of the Fruſtum is 65 *F.* ,25 or $\frac{1}{4}$.

Of a Circle.

Figure the Seventh.

A Circle is contained under one Line, called the Circumference or Periphery; as *ABC.* All right Lines drawn from the Centre *E* to the Circumference, are equal, and called Radius's, or half Diameters: and the long Line through the Centre from *A* to *C,* is the Diameter.

To divide a Circle in 6 equal Parts, extend the Compaſſes to half the Diameter, as from *A* to the Centre *E,* and the Extent will do it.

A Circle repreſents the Globe of the Earth, or Terreſtrial Sphere; which, if it be divided into 360 Parts, they are called Degrees; each of which, on the Face of the Earth, is accounted 60 Miles; ſo that 360 multiplied by 60, produces 21600 Miles from the Circumference, according to this Verſe:

Geography the World's vaſt Compaſs ſtiles,
Twenty-one Thouſand and Six Hundred Miles.

Half the Semi-circle of the Circle, that is, half of the half of the Circle, is called a Quadrant, or Quarter.

If the Diameter of a Circle be 7 Inches or 7 Foot in Length; then is the Periphery or Compaſs 22 Inches, or 22 Foot about.

Example 1.

If the Compaſs of a Circle be 66 Foot, what is the Diameter?

Multiply 66 by 7, and divide the Product by 22, and the Quotient gives the Diameter.

66
7

22) 462 (21 Foot, Anſwer.
44

22
22

(0)

Example 2.

If the Diameter be 21 Inches, what is the Circumference?

The Operation is juſt the Reverſe, viz.

21
22

42
42
7) 462

Inch. 66 *Anſw.*

If a Globe be 31 Inches $\frac{3}{7}$ in Compaſs, what is the Diameter?

Work'd Fractionally thus:

Say 7 times 1 is 7, and 3 the Numerator makes 10, 0 and carry 1; then 7 times 3 is 21, and 1 carried is 22: So the Product is 220 the Dividend; which divide by 22, agreeable to the Proportion before-mentioned.

Example of Operation.

31 $\frac{3}{7}$
7

22) 220 (10 Anſwer, 10 Inches Diameter.

(0)

Example 3.

Contra. If a Circle be 10 Inches Diameter what is the Circumference?

The Work.

22
10

7) 220

31 $\frac{3}{7}$ *Anſwer* and *Proof.*

To meaſure the ſuperficial Content of a Circle, either in Inches or Feet.

Rule. Multiply half the Periphery or Compaſs, by half of the Diameter, and the Product will be the Content.

Example.

Admit a round Table to be 14 Inches Diameter, and 44 ditto in Compaſs; what's the ſuperficial Content in ſquare Inches?

22 half the Compaſs,
7 half the Diameter,

154 *Anſwer.*

Or if the Diameter be ſquared or multiplied into itſelf, and that Product multiplied by 11, and the Reſult thereof divided by 14, gives the ſame Content.

Example.

14 multiplied
by 14
produces 196
multiply by 11
196
196
divide by 14)2156 (154 Quotient.
&c. as before.

Figure the Tenth.

To meaſure half a Circle or round Table, *viz.*

Rule. Square the Semidiameter *CD*, and that Product multiply by 22, and divide by 14; ſo the Anſwer is 77 ſquare ſuperficial Inches.

Inches.
7
7
49
22
98
98
14) 1078 (77 *Anſwer.*

To meaſure the Quarter or Quadrant of a Circle.

Rule. Multiply the Line *C E* into itſelf, and proceed as before; but multiply the firſt Product by the half of 22, *viz.* 11

$3\frac{1}{2}$
$3\frac{1}{2}$
$10\frac{1}{2}$
$1\frac{3}{4}$
$12\frac{1}{4}$
By 11
14) $134\frac{3}{4}$ (9 In. $\frac{1}{2}$ $\frac{7}{14}$.
126
&c.

Decimally ought to be thus,

3,5
3,5
12,25
11
1225
1225
14) 134,75 (9,62 $\frac{1}{2}$
126
87
84
35
28
7

The Decimal Work produces the ſame Anſwer as the other, *viz.* —————— $\left\{\frac{9,62}{100}\right\}$ equal to half an Inch, and $\frac{1}{4}$ or half of half an Inch.

By theſe Methods may a Piece of Timber, that is half round, or a quarter round, at the Baſe or End, be meaſured; that is, by multiplying the ſquare Inches at the End by the Inches of the Length.

Of Timber Meaſure.

WHEN at any time you would know the Content of any Piece of Timber by Vulgar or Decimal Arithmetick, obſerve what follows, *viz.* The Tree being girted, and one fourth Part taken for the Side of the Square; multiply the Length of the Side of the Square in Inches into itſelf, and that Product by the Length in Feet; which laſt Product divide by 144: But if you multiply by the Length in Inches, then your Diviſor muſt be 1728, and if any thing remains, divide ſuch Remainder by 12, and the Quotient will be the odd Inches.

Example.

Suppoſe a Piece of Timber 15 Foot long, and a Quarter of the Girt 42 Inches; what is the Content of that Piece?

The Work.

```
            42 Inches the Side of the Square.
            42
          ------
            84
          168
          ------
          1764
            15 Foot in Length.
  ----------------F. I.
  144) 26460 (183,9 Anſwer.
       144 ..
       ------
       1206
       1152
       ------
        540
        432
  ------------
  12)   108 (9 Inches.
       ------
        108
        108
       ------
        (0)
```

Note, In this Example 1764 is multiplied by 15 in one Line.

But the foregoing Example may be worked ſhorter by Decimals, thus:

$$\text{Squared}\begin{cases}3{,}5 & \text{the Side of the Square 42 Inches.}\\ 3{,}5\end{cases}$$

175
105

12,25 The Product are Feet.
15 Feet the Length.

6125
1225

183,75 the Cont. *viz.* 183,$\frac{75}{100}$ or $\frac{3}{4}$ as before.

Admit a Piece of Timber or Stone be 9 Inches thick, 15 Inches broad, and 12 Foot long; what is the Content in ſolid Feet? See Figure the 11th.

15 broad.
9 thick.

135
12 length.

144) 1620 (11 Foot 3 Inches.
144

180
144

12) 36 (3

(0)

Of Board-Meaſure.

WHENEVER the Breadth is given in Inches, and the Length of the Board in Feet, then only multiply one by the other, and divide the Product by 12, and the Quotient will be the Anſwer in ſquare Feet: But if the Breadth and Length be given both in Inches, then multiply one by the other, and divide by 144, and the Quotient will be the Anſwer in ſquare Feet.

Example 1.

Suppoſe a Board (or any other thing of flat Meaſure) be 15 Inches broad, and 16 Foot long: what is the Content in ſquare Feet?

192 Length in Inches.
15 Breadth in Inches.

144) 2880 (20 Feet.
288

(0)

15 Breadth in Inches.
16 Length in Feet.

90
15

12) 240
20 Anſwer 20 Feet.

Here the Example is wrought both ways, as aboveſaid, and the Anſwers are both alike.

Example 2.

Suppoſe a Board be 8 Inches and $\frac{1}{4}$ in Breadth, and 16 Foot long; what is the Content in ſquare Feet? The Work follows.

8 $\frac{1}{4}$ Breadth.
4 and by 4

33
4

12) 132

Anſwer 11 Foot

In this Example, I multiply by 4 and 4, the component Parts or Ratio's of 16 the Length.

Example.

Again, Admit a Board 17 Inches $\frac{3}{4}$ broad, and 28 Foot long, what is the Content?

17 $\frac{3}{4}$
7 and 4

124 $\frac{1}{4}$
4

12) 497

Anſwer 41 Foot $\frac{5}{12}$

This Example is multiplied by 7 and 4, the Ratio's of 28 the Length.

Once more by the other Way. Suppoſe a Board be 32 Inches broad, and 37 Foot or 444 Inches in Length; what is the Content?

4 and 8 Breadth.

1776
8

144) 14208 (98 Foot and $\frac{2}{3}$.
1296

1248
1152

(96)

The Parts of a ſuperficial Foot, or 144 *ſquare Inches.*

Inches.	
72	half a Foot.
108	three quarters.
126	three quarters and half a quarter.
36	a quarter of a Foot.
18	half a quarter.

In the laſt Work, I multiply 444, the Inches of the Length, by 4 and 8, the component Parts of 32, the Inches of the Breadth; and then divide the laſt Product by 144, and the Anſwer is 98 Foot, and 96 ſquare Inches remain, which is two thirds of a Foot.

Mr. *Darling*, in his Treatiſe of the *Carpenter's Rule*, hath with great Pains, (and no doubt with as great Care) given a great many Tables for the Anſwer of ſundry Dimenſions in Board and Timber Meaſure; but he meaſures beſt, that doth it experimentally by Arithmetick, by thoſe ſhort and eaſy Rules before and hereafter mentioned, and takes not things upon truſt; for tho' Tables may be right, ſo perhaps they may be alſo wrong, (for Error is endleſs;) and then to be wholly guided by ſuch Tables, it would be of ſad and very pernicious Conſequence; and if the Artiſt is ignorant of Arithmetick, he will be bewildered and plunged into inextricable Difficulties.——I muſt confeſs, that Tables are of conſiderable Help in caſe of Expedition; but then you muſt be very well acquainted with them; otherwiſe I can in much leſs time caſt up the Dimenſions, than you ſhall be in finding out your ſeveral Numbers, and adding or ſubtracting them, &c. No Man that is wiſe, ought to depend upon any Table for his Government, till he hath proved the Truth of every Line; and he that is able to do that, is capable of making any Table for his own Uſe; which if he takes care that it be correct, he is well provided, and need not be led into Error or Confuſion by falſe Tables.

Timber, or Solid Meaſure.

DIMENSIONS here are conſider'd in Breadth, Thickneſs and Length; the Breadth and Thickneſs are commonly called the Square; which multiplied one in the other, and that Product multiplied by the Length in Inches, and divided by 1728, the Quotient of that Diviſion is the Anſwer in ſolid Feet.

Example.

Suppoſe a Piece of Timber be 15 Inches ſquare; that is, 15 Inches broad, and 15 Inches thick, and 16 Foot or 192 Inches long; what is the Content of that Piece of Timber or Stone (or any other thing that is to be meaſured by cube or ſolid Meaſure) in ſolid Feet?

```
   15 Broad.
   15 Thickneſs.
 -----
   75
  15
 -----           1728) 43200 (25 Foot.
  225                  3456
  192                  -----
 -----                  8640
  450                   8640
 2025                   -----
 225                     (0)
 -----
43200 ſolid Inches.
```

So the Anſwer is 25 Foot of ſolid Timber in ſuch a Piece, or in ſuch a Stone of ſuch Dimenſions. ———

Or if you multiply the Content of the Square by the Length in Feet, and divide that Product by 144, the Quotient will give the ſame Content or Anſwer as before. See the following Work.

15
15

225 the Square.
16 the Length.

144) 3600 (25 ſolid Feet the Content.

A ſecond Example in this, may be after the ſecond Example in Board Meaſure. That is, ſuppoſe a Piece to be 8 Inches one Quarter Square, and the Length 192 Inches; what is the Content?

1728) 13068 (7 *Anſwer.*
12096

972

Anſwer, 7 Foot and half, and 108 Cubic Inches.

Decimally.

8,25 68,0625 ſquare Inches.
8,25 192 Length in Inches.

4125 1361250
1650 6125625
6600 680625

68,0625 13068,0000

Another Example. Suppoſe a Piece of Timber to be 17 Inches three quarters Square, and 28 Foot long, what is the Content?

17 Inches three quarters multiplied into itſelf Decimally, the Product will be 3150625: which multiplied by the Length 336, the Product will be 105861, cutting off the four Cyphers, and the Anſwer will be 61 Foot, and 453 remains, being one fourth of a Foot and 21 Inches, as may be gathered by the Parts following.

The Parts of a ſolid Foot, being 1728 Inches.

Half a Foot	864 Inches.
A Quarter of a Foot	432 Inches.
Three Quarters of a Foot	1296 Inches.
Half a Quarter of a Foot	216 Inches.

How to know in ſuperficial or flat Meaſure, having the Breadth, what Quantity in Length of that Board or Piece of Glaſs will make a Foot ſquare.

Rule. Only make the Breadth in Inches Diviſor to 144, the ſquare Inches in a ſuperficial Foot, and the Quotient will be the Length in Inches that will make a Foot.

Example.

If a Board be 8 Inches broad, what Length of that Board (or Piece of Glaſs) will make a Foot?

8) 144

Anſwer, 18 Inches, or 1 Foot and half.

Again, If a Board be 16 Inches broad, what Length of it will make a Foot?

16) 144 (9 Inches. *Anſwer,* 9 Inches.

This Method is manifeſtly true, from this Obſervation; that a Board of a Foot or 12 Inches broad, will require a Foot, or 12 Inches in Length, to make it exactly ſquare, or 144 Inches: And this is known without Operation. By this Method may a Table of Board or Glaſs Meaſure be proved.

Likewiſe in ſolid Meaſure to know what Length of the Piece of Timber will make a Foot ſolid, you muſt make the Inches ſquared Diviſor to 1728, (the ſquare Inches in a Foot ſolid) and the Quotient will be the Anſwer in Inches of Length, that will make a Foot ſolid.

Example.

If a Piece of Timber be 8 Inches ſquare, what Length of it will make a Foot?

64) 1728 (27
128

448
448

---

(0)

Anſwer, 27 Inches, or 2 Foot 3 Inches in Length.

Here the Square of 8 is 64, *&c.*

Again. Suppoſe a Piece be 18 Inches ſquare, what Length will make a Foot? *Anſwer,* 5 Inches and one third.

The Square of 18 is 324) 1728 ($5\frac{108}{324}$ equal to $\frac{1}{3}$.
1620

---

(108)

Once more. Admit a Piece of Timber be 2 Foot 2 Inches ſquare, *i. e.* 26 Inches ſquare, which is, *&c.*

676) 1728 (2 Inches $\frac{376}{676}$ or $\frac{1}{2}$ *Anſwer.*
1352
——
(376)

So if a Piece be 10 Inches ſquare, the Anſwer will be, that 17 Inches and $\frac{28}{100}$ of an Inch is required for the Length. And thus may a Table of ſquare Timber be proved.

Sawyers Work.

IN this Place it may not be improper to ſay ſomething in relation to the Method uſed by *Sawyers* in meaſuring their Work. When they work by the Great (as they ſay) moſt commonly they meaſure their Work by the ſuperficial Foot; ſo there is no great Difficulty in taking the Dimenſions; for they account the Depth of the Kerf for the Breadth, and the Length for the Length. The Dimenſions being thus taken in Feet, the Content of one Kerf ſuperficial, may be found by multiplying the Length by the Breadth; and then having found the Number of Feet in one Kerf, multiply it by the Number of Kerfs of the ſame Dimenſions, and you will have the Number of Feet in them all.

Note, 1*ſt*, When thus they have caſt up the whole Content of their Work in Feet, they are paid for it by the Hundred, that is, 100 Feet.

2*dly*, That if the Kerf be but ſix Inches or leſs in Depth, then they have a Cuſtom to be paid for Kerf and half, (as they expreſs it) *i. e.* for half ſo much more as it comes to by Meaſure; and the Reaſon they give for it is, that the Trouble is ſo much the more on account of often *ſhifting* or removing and new binding their Timber, and therefore they inſiſt on it as a cuſtomary Price.

3*dly*, For breaking Work, (that is, for cutting a Piece of Timber or Tree through the Middle) and Slabbing it (*i. e.* cutting off the Outſide Pieces) if the Kerf be more than 12 or 13 Inches deep, they are paid by the Foot Lineal or Running Meaſure, at different Prices, according to the various Depths of the Kerf; and are as follows;

Inches deep.	*d.*	*qrs.*	
15	1		*per* Foot.
18	1	2	
20	2		
22	2	2	
24	3		
26	3	2	
28	4		
30	4	2	
32	5		
34	5	2	
36	6		

4*thly*, In ſome Places it is cuſtomary to allow the Sawyer but one breaking Kerf in a Tree, tho' there be never ſo many Kerfs deep in it.——But ſome Sawyers claim to have half Breaking Work, and half Hundred Work; that is, if they have four Kerfs deep, then they will have two Breaking Work, and the other two Hundred Work.

5*thly*, In Sawing Bevil Work, as Hipps, Sleepers, *&c.* Poſts, *&c.* in Bevil-Frames, Poſts or Puncheons in Polygonal Turrets, *&c.* alſo Cantrails, *&c.* for theſe they work by the Hundred, but always reckon Kerf and half for ſuch ſort of Work; that is, they reckon half as many more Feet of Work than there is really performed.

Thus have I gone thro' what I have Room for, in relation to the ſeveral Deſcriptions and Uſes of the Inſtruments commonly made Uſe of in Menſuration, and particularly applied to the Service of that ingenious Artiſt the Carpenter.

The next neceſſary Qualification that I ſhall touch upon, to introduce a young Man in the Knowledge of Buſineſs, is to ſay ſomething in relation to the Art

Of Gauging.

THERE is a near Sort of Kindred or Affinity between the Art of Meaſuring of Timber, and that of Gauging or Meaſuring of Liquors; for both are performed by cube or ſolid Meaſure, and therefore not improper cloſely to follow one another. For as often as there are found 1728 ſolid or cubic Inches in a Piece of Timber, (of what Form ſoever) ſo many ſolid Feet it is ſaid to contain: So likewiſe in the Art of Gauging, ſo many Times as 282 (the ſolid Inches in a Beer or Ale-Gallon) are found in any Veſſel of ſuch Liquor, ſo many Gallons is ſuch a Veſſel ſaid to hold. And ſo of Wine; but in that the Diviſor alters, it being 231 ſolid or cubic Inches.

And the Gallon of Dry Meaſure, contains 272 ¼ cubical Inches.

Note, *Every cubical Foot in Beer or Ale-Meaſure, contains 6 Gallons and almoſt a Pint.*

The ſame in Wine Meaſure, is 7 Gallons, 2 Quarts, and almoſt a Pint.

A cubical Foot of Dry Meaſure contains 6 Gallons and ſomewhat above half a Gallon.

For 141 Inches make 2 Quarts of Beer or Ale; 70 Inches ½ one Quart, and 35 Inches ¼ a Pint.

To find the Content of any Veſſel that hath the Form of a Cube, that is, a Figure whoſe Breadth, Depth, and Length are all equal, and is very well repreſented by the Shape of a Dye commonly play'd withal.

Rule. Multiply the Side into its ſelf, and then again that Product by the Side; which laſt Product, if for Beer or Ale, divide by 282, the Inches in a Beer or Ale Gallon; and for Wine, Brandy, *&c.* by 231, the cubical ſquare Inches contained in a Wine Gallon.

Example.

Suppoſe a Cube, whoſe Side is 79 Inches, I demand the ſolid Content in Beer and Wine Gallons?

```
    79
    79
   ---
   711
  553
  ----
  6421
    79
 -----
 56169
43687
------
493039 Cube Inches
```

```
282)493039(1748 Beer or Ale Gall.
    282···
    ----
    2110
    1974
    ----
     1363
     1128
     ----
      2359
      2256
      ----
      (103)
```

```
            Wine G.
231)493039(2134
    462···
    ----
     ·310
      231
      ---
      ·793
       693
       ---
       1009
        924
       ----
        (85)
```

To find the Content of a Parallelepipedon, which is a ſolid Figure contained under ſix Sides, of which the Oppoſites are parallel, and of the Form of Figure the 12th.

Rule. Multiply the Length by the Breadth, and that Product by the Depth; and then divide by 282 for Beer or Ale, and 231 for Wine.

Example.

Admit the Length to be 95 Inches, and the Breadth 62 Inches, and the Depth 23 Inches; what is the Content in Beer and Wine Gallons?

231) 135470 (586 Wine Gallons.
1155
1997
&c.
Rem. (104)

95 Length,
62 Breadth.
190
570
5890
23 Depth.
17670
11780
282) 135470 (480 Beer Gall.
1128
&c.
rem. (110)

To Gauge a Back, or ſquare Tun.

Example.

Suppoſe its Length 112 Inches, Breadth 72 Inches, and its Depths 48 Inches; what is its Content in ſolid Inches, and alſo its Content in Beer Gallons?

112 Length.
72 Breadth.
224
784
8064
48 Depth.
64512
32256
387072 ſolid Inches.

282) 387072 (1372 Gallons, *Anſw.*
282 · · ·
1050
846
2047
1974
732
564
(168)

To bring theſe Gallons into Barrels, divide them by 36, the Gallons in a Barrel of Beer, thus:

```
36) 1372 (38
    108
    ———
     292
     288
    ———
     (4)
```

Anſwer, 38 Barrels and $\frac{4}{36}$ or $\frac{1}{9}$ of a Barrel; and for the Remainder 168, it is ſomething above half a Gallon.

Note, *The Duty of Exciſe upon Strong Beer and Ale, is* 6 s. *and* 6 d. *per Barrel: Brewers are allow'd three Barrels in twenty-three for Leakage,* &c. *both for Strong and Small Beer; and for Ale, two in twenty-two: So that the neat Exciſe of a Barrel of Strong Beer to be paid by the common Brewers, is* 5 s. 7 d. $\frac{3}{4}$ and $\frac{7}{23}$ *of a Farthing; and of Ale,* 5 s. 10 d. $\frac{3}{4}$ *and* $\frac{7}{11}$ *of a Farthing; and for Small Beer* 1 s. 3 d. $\frac{1}{2}$ *and* $\frac{2}{3}$ *of a Farthing.*

How to Gauge a Copper, round Tub or Furnace.

If it be of equal Bigneſs both at Top and Bottom, find the cube Inches that it contains, and then bring it into Gallons as before.

But if it be wider at the Top than at the Bottom, or the contrary; then take the Width or Diameter of the Tub ſomewhat above the middle, next to the broadeſt End, if it be taper; or find the mean Diameter thus: Suppoſe the Bung Diameter to be 26 Inches, and the Head Diameter of the Caſk or Tun to be 23 Inches, the Difference between which is 3 Inches, two thirds of which make two Inches; which added to the leſſer of the two Diameters, makes 25 for the mean Diameter ſought. Having the mean Diameter, proceed to find the Content in ſolid Inches, thus: Firſt ſquare the mean Diameter, which Product multiply by 11 always, and divide ever by 14, and the Quotient will give the Content of the Liquor at one Inch deep, if there be any in the Caſk, Tub, Tun, or Furnace.

Example.

Suppoſe the mean Diameter to be 72 Inches, and the Length 56 Inches.

```
     72
     72
     ——
    144
   504
   ————
   5184 the Square of the mean Diameter
     11
 ——————
14) 57024    (4073
    56···       56 the Length.
    —————    ——————
     102      24438
      98     20365
     ———     ——————
      44     228088 ſolid Inches.
      42
     ———
     (2)
```

The aforeſaid ſolid Inches brought into Gallons, make 808, and 232 ſolid Inches remain, ſomething above three quarters of a Gallon; in all 22 Barrels, 16 Gallons, and $\frac{3}{4}$ of Beer.

Again, Admit the mean Diameter of a Spheroid or Wine Pipe to be 14 Inches, and the Length 72 Inches, what's the Content in Wine Gallons?

```
                 14
                 14
                ———
                196 the Square of the mean Diameter 14.
    Multiply by  11
                ————
Div. by 14) 2156 (154
                   72 the Length.
                 ——————
                  308
                 1078
                 ——————
           231) 11088 (48 Gallons Anſwer.
                 924
                —————
                 1848
                 1848
                —————
                  (0)
```

Or the Content of a Spheroid may be found thus: Multiply the Square of the ſhorteſt Diameter by the longeſt Diameter, and then divide by 583 for Beer Gallons, and by 441 for Wine Gallons.

Example.

Suppoſe a Spheroid whoſe ſhorteſt Diameter is 74 Inches, and the longeſt 125 Inches; what is the Content in Beer and Wine Gallons?

74
74

296
518

5476 the Square of the ſhorteſt Diameter.
125 the longeſt Diameter.

27380
65712

538) 684500 (1272 Gallons of Beer.
538

1465, &c.

(164)

441) 684500 (1552 Gallons of Wine.
441

2435, &c.

(68)

To find the Content of the Fruſtum of a Spheroid: Firſt take the Diameter at the Bung Circle, and find its Content in ſuperficial Inches by multiplying it into its ſelf, then multiply that Product by 11, which Product divide by 14, and the Quotient gives the Content; and then take two Thirds of that Number or Content. This do for the Diameter of the Head of the Caſk; then add theſe two Thirds together, and multiply that Total by the Length of the Caſk in Inches, and the Product will give the Content of the Veſſel in Cubic Inches; which may be reduced into Gallons as before.—Or thus; to twice the Square of the

Bung Diameter, add once the Square of the Head, and multiply that Sum by the Length: And for Beer divide by 1077; and for Wine Gallons, divide by 882.

Example.

A Caſk whoſe Bung Diameter is 23 Inches, Head Diameter 21 Inches, and Length 27 Inches; what is the Content in Beer and Wine Gallons?

23
23
——
69
46
——

21
21
——
21
42
——
441

$$\text{add}\left\{\begin{array}{r}529\\529\\441\end{array}\right\}\begin{array}{l}\text{twice the Bung Diameter.}\\\text{once the Head Diameter.}\end{array}$$

——
1499
27 the Length.
——
10493
2998
——
1077) 40473 (37 Beer Gallons.
3231·
——
8163
7539
——
(624)

882) 40473 (45 Wine Gallons.
3528·
——
5193 almoſt 46 Gallons.
4410
——
(783)

To find the Quantity of Liquor remaining in a ſpheroidical Caſk ſtanding on its Head.

From the Area of the Bung Diameter, ſubtract the Area of the Head Diameter, and multiply the Remainder by the Square of the Difference between the Wet Inches and the Semi-length, and this Product divide by the triple Square of the half Length, and ſubtract the Quotient from the Area of the Bung Diameter; then multiply the Remainder by the Difference between the Wet Inches and the Semi-length, and the Product will be how much Liquor is contained in the Veſſel above, or under its half Content.

Example.

Suppoſe { the Bung 40,8; the Heads 35,3; the Length 61,8; the Wet Inches 41,9 } what is the Content in Beer Gallons?

61,8 the Length
30,9 the half Length

31,9 the Wet Inches
209 the half Length

11,0 the Difference.

11
11

are 121

Area of the Bung Diameter 4,6362
Ditto of the Head Diameter 3,4705 ſub.

1,1657
The Square of the Difference 121

11657
23314
11657

The triple Sq. of the ½ Length 2865) 141,0497 (492
11460

26449
25785

6647
5730

(917)

30,9
39,9

2781
9270

954,81
3

2864,43

4,6362 Area of the Bung.
ſub. 492 the Quotient

45870
11

50,4570

131,25 the half Content of the Veſſel.
50,45 the Liquor qt. above the half Content.
118,70 the Quantity of Liquor qt. in the Veſſel.

To Gauge any thing that hath the Shape of a Wooden Hand-Bowl, as the Bottom of a round Copper, &c.

Admit the Bowl to be full of Water; the firſt Thing is to meaſure the Surface of the Water; that is done by multiplying half the Circumference by half the Diameter, and that gives the Content in ſuperficial ſquare Inches. Then find the Depth of the Water in different Places, then add thoſe different Depths together, and divide the Total by the Number of Depths that you take, and the Quotient gives the mean Depth: When you have found the mean Depth, multiply it by the Number of Inches that you found on the Surface of the Water, and the Product gives the ſolid ſquare Inches; which reduce to Gallons as taught before.

Example.

Suppoſe the Circumference be 120 Inches, the half of which is 60 Inches, and the Diameter admit to be 60 Inches, the half of which is 30 Inches; and ſuppoſe the ſeveral Depths to be 7, 8, 9 and 10, which put together make 34 Inches; which divide by 4, the Number of Depths quotes the mean Depth, *viz.* 8 $\frac{1}{2}$

60
30
———
1800
8½
———
14400
900
———
231) 15300 (66 *Anſwer*, 66 Wine Gallons, 3 Gallons above a Hhd.
1386·
———
1440 282) 15300 (and 54 Beer Gallons or a Hhd.
1386 1410·
——— ———
(54) 1200
1128
———
(72)

Having the Circumference of a Circle, to find the Diameter; *&* *contra*, having the Diameter of a Circle, to know its Circumference.

The Proportion is as 7 to 22.

So that if the Length of the Diameter be 7 Inches, then the Circumference is 22 Inches.

Example.

If the Circumference of a Circle be 132 Inches, what is the Diameter? Multiply by 7, and divide by 22, *&c.*

132
7

22) 924 (42
88

44
44

(0)

Anſwer, the Diameter is 42 Inches in Length.

Again, If the Diameter be 42 Inches, what is the Circumference ?

42
22

84
84

7) 924

Proof 132 Inches *Anſwer.*

Once more. If the Circumference of a Circle be 50 Inches $\frac{2}{7}$ what the Diameter ?

50
7

22) 352 (16 Inches.
22

132
132

(0)

If the Diameter be 16 Inches, what the Circumference ?

22

32
32

7) 352

50 In. $\frac{2}{7}$ *Anſwer.*

The Extraction of the Square and Cube Roots, of great Uſe in Meaſuring, Gauging, &c.

The Square-Root.

1*ſt*. A Square Number is any Digit, or any other Number, which being multiplied into itſelf, produceth a Square Number; as 4 multiplied by 4, produceth 16; ſo 16 is the ſquare Number, and 4 is ſaid to be the Root of 16, becauſe it grows from, or is produced of 4; ſo 4 is the Square of 2, for twice 2 is 4, and 9 is the Root of 81, for 9 times 9 is 81, *&c.*

2*dly*, To extract the Square Root of any Number, is to find another Number which multiplied by (or into) itſelf, produces the Number given, and is a Proof of the Work.

3*dly*, Square Numbers are either Single or Compound.

4*thly*, All ſingle ſquare Numbers, with their reſpective Roots, are contained in the following Table, *viz.*

Roots.	1	2	3	4	5	6	7	8	9
Squares.	1	4	9	16	25	36	49	64	81

5*thly*, When the Root of any ſquare Number is required leſs than 100, and yet not exactly a ſingle Square expreſſed in the Table above; then you are to take the Root of the ſquare Number expreſſed in the Table, which (being leſs) comes the neareſt to the given Number to be ſquared: As ſuppoſe 60, the neareſt Root to it (as being leſs) is 7, and 12 being given, the Root belonging to it is 3.

6*thly*, A Compound ſquare Number is that which is produced of a Number conſiſting of more Places than one, multiplied by itſelf, and never leſs than 230: ſo 729 is a Compound ſquare Number, produced by the multiplying 27 into itſelf.

7*thly*, The Root of any Number under 100 may be eaſily known by the foregoing Table of ſingle Squares: But to extract the Root of a compound Number of ſeveral Places, obſerve the following Directions, in relation to the finding the Root of this ſquare Number 45796.

1. Set a Point over the Place of Units thus, $4579\dot{6}$, and ſo ſucceſſively over every ſecond Figure towards the Left-hand, as thus, $45\dot{7}9\dot{6}$; and again thus, $\dot{4}5\dot{7}9\dot{6}$. Thus muſt your Number be prepared for Extraction in Natural Numbers: But in the Decimals, you muſt point from the Place of Primes towards the Right-hand, omitting one Place, as above; and if the Decimals are odd, affix a Cypher towards the Right-hand of them to make them even. Your Number thus prepared, draw a crooked Line on the Right of the Number, as in Diviſion: And indeed the Operation of the ſquare Root is not much unlike Diviſion; only there the Diviſor is fix'd, and in the ſquare Root we are to find a new one for each Operation. I ſay having made a crooked Line thus, $\dot{4}5\dot{7}9\dot{6}$ (ſeek the neareſt Root in the foregoing Table, to the firſt Point on the Left-hand, which here is 4, the Root of which is 2, which place behind the crooked Line thus:

$$\begin{array}{l}\dot{4}5\dot{7}9\dot{6}\ (2\\ 4\\ \hline (0)\end{array}$$

and ſubtract it, and there remains 0: Then to the Remainder, bring down the next Point $5\dot{7}$ thus:

$$\begin{array}{l}\dot{4}5\dot{7}9\dot{6}\ (2\\ 4\\ \hline 057\end{array}$$

which call the Reſolvend; then double the Root of the firſt Point, and place it on the Left-hand of the Reſolvend (or proper enough the Dividend) thus:

$$\begin{array}{rl} & \dot{4}5\dot{7}9\dot{6}\ (2\\ & 4\\ \hline 4) & 57\end{array}$$

The 4, the double of the Root 2, on the Left-hand of the crooked Line, call the Diviſor; then ſeek how often 4, the Diviſor, can be taken in 5, the firſt Figure of the Reſolvend

57, for you are to omit the laſt Figure towards the Right-hand, which here is one, which I place behind the Root 2, and alſo behind the Diviſor 4, thus:

```
     .  .  .
     45796 (21
     4
   -------
 41) 57
```

Then multiply the Diviſor (now) 41, by the Figure laſt placed in the Root, *viz.* 1, and place it under the Reſolvend thus, and ſubtract it therefrom.

```
     .  .  .
     45796 (21
     4
   -----
 41) 57
     41
   -----
     16
```

Then bring down the next Point, *viz.* 96, and place it on the Right of the Remainder 16, for a new Reſolvend or Dividend, thus: next double the Quotient, or part of the Root, *viz.* 21, and place it for a new Diviſor to the new Reſolvend 1696, thus:

```
      .  .  .
      45796 (21
      4
    -----
  41) 57
      41
   -------
 42) 1696
```

Then ſeek how oft 42 in 169? (ſtill reſerving or omitting the unit Figure of the Reſolvend or Dividend, as aforeſaid) and I find I can have it 4 times, which I place in the Quotient, or Place of the Root, and then the Work appears thus:

```
      .  .  .
      45796 (214
      4
     ---------
  41) 57 Reſolvend
      41
     -----
 424) 1696 Reſolvend
      1696 Product.
     ------
```

In the laſt Step, I place 4 in the Root, and likewiſe 4 behind the Diviſor 42, which makes the new Diviſor 424, to the Reſolvend 1696; which Diviſor multiplied by 4, the Times placed in the Root, produces 1696; equal with the Dividend or Reſolved aforeſaid, as in the Operation may be ſeen. So that the ſquare Root of 45796 is 214; for, 214 multiplied into its ſelf, produces 45796, the Number given, whoſe ſquare Root was ſought,

More Examples.

What's the ſquare Root of 12299049 (3507 the Root?

9

1ſt Diviſor 6) 329 Reſolvend.

325 Product,

2d Diviſor 700) 490 Reſolvend.

000 Product.

3d Diviſor 7007) 49049 Reſolvend.

49049 Product.

(0)

Decimally.

160,000000 (12,649

1

1ſt Diviſor 22) 60

44

2d Diviſor 246) 1600

1476

3d Diviſor 2524) 12400

10096

4th Diviſor 25289) 230400

227601

(2799)

Note, *That when the Diviſor cannot be had in the Reſolvend, then place a Cypher in the Quotient, and alſo in the Right of the Diviſor, and bring the Reſolvend a Step lower, and then bring down the next Square,* &c. *as in the Example above may be ſeen.*

Note ſurther, *If any Remainder happen to be after Extraction, you may proceed by annexing Pairs of Cyphers to the Left of the given Number, and ſo come to what Exactneſs you pleaſe.*

Note alſo, *Such Numbers given for Extraction that leave Remainders, are by ſome called* Irrationals, *becauſe their Roots cannot be exactly diſcovered, but ſtill there will ſomething remain, tho' you work by whole Numbers or Fractions: As in the Example above, where the Remainder is* 2799.

The Extraction of the Cube Root.

TO extract the Cube Root of any Number, is to find another Number which, multiplied by itſelf, and that Product by the Number found, produces the Number given for Extraction.

From the foregoing Table for Extraction of the ſquare Root, proceed the ſeveral Squares of the Cube Root; *viz.*

Roots,	1	2	3	4	5	6	7	8	9
Squares,	1	4	9	16	25	36	49	64	81
Cubes,	1	8	27	64	125	216	343	512	729

1*ſt*, To prepare any Number for Extraction, make a Point over Unity, and ſo ſucceſſively over every third Figure, miſſing two between each Point; but in Decimals, you muſt point from the Place of Units to the Right-hand, &c.

Example.

Extract the Cube Root of 46656, prepared thus, as above directed.

$\dot{4}665\dot{6}$

Here are but two Points, therefore the Root will have but two Places.

2*dly*, The Number being prepared, ſeek in the foregoing Table the neareſt Root to the firſt Point or Period 46, which you will find to be 3, which place in the Quotient thus, $\dot{4}665\dot{6}$ (3 the Cube or Triple whereof, *viz.* 3 is 27, which place under your firſt Point 46, as in the Margin; the which ſubtract from 46, and there reſts 19; this is your firſt Work, and no more repeated. Then to the Remainder 19, bring down the next Period, *viz.* 656 (which is the laſt) and place it on the Right of the Remainder 19,

46656 (3
27
——
19

46656 (3
27
——
19656 Reſolvend.

Then draw a Line under the Reſolvend; next ſquare the 3 placed in the Quotient, which makes 9, which multiplied by 300 makes 2700 for a Diviſor, which place accordingly thus:

46656 (3
27
——
2700) 19656

Then ſeek how often 2 in 19? *Anſwer*, but 6 times, becauſe of the Increaſe that will come from the Quotient; then multiply the Diviſor by 6, and the Product will be 16200; which place orderly under the Dividend thus:

46656 (36
27
——
19656
——
16200

Then proceed to find the Increaſe coming from the Quotient, thus: Square your laſt Figure 6, and it makes 36; which multiply by 3, the other Figure of the Quotient, it gives 108; which multiplied by 30, makes 3240. This place alſo orderly under the laſt Number before ſet down, *viz.* 16200, and the Work will appear thus:

46656 (36
27
——
2700) 19656 Dividend.
16200
3240
216
——
19656

Then cube the Figure laſt placed in the Quotient, *viz* 6, and it makes 216; which place orderly likewiſe under the Line 3240, as above; then add the three Lines together, and they make 19656, (for ſo many you always have after the firſt Operation.) And ſeeing the Total to be equal to the Dividend above, *viz.* 19656, and no more Periods to bring down, I ſee the Work finiſhed, and find the Cube Root of 46656 to be 36.

Some Uſes of the Square and Cube Roots.

Rule. THE Root of the Product of the given Numbers, is the mean Proportional ſought; ſo the mean Proportional between 16 and 64, will be 32. This is of good Uſe in finding the Side of a Square, equal to any Parallelogram, Rhombus, Rhomboides, Triangle or Regular Polygon.

2. *To find the Side of a Square equal to the Area of a given Superficies.*

Rule. The ſquare Root of the Content of any given Superficies is the Side of a Square.—So if the Content of a given Circle be 160, the Side of the Square equal will be $12\frac{32}{49}$, or in Decimals 12,64911.

3. *The Area of a Circle given to find the Periphery.*

Rule. Say, as 113 to 1420, or 1 to 12,56637; ſo is the Area to the Square of the Periphery.—So if the Area of a Circle be 160, the Periphery will be ſound to be 44,84.

4. *The Area of a Circle to find the Diameter.*

Rule. As 355 to 452, or as 1 to 1,273239, ſo is the Area to the Square of the Diameter.

5. *Any two Sides of a Right-Angled Triangle being given to find the third Side.*

In this uſeful Problem lies hid a great Part of the Mathematicks; it being aſſerted and proved, that the Square of the Hypothenuſe, or longeſt Side of a Right Angled Triangle, is equal to the Sum of the Squares of the Baſe and Perpendicular, that is, the other two Sides.

Example by Figure 13.

Let the Baſe or Ground *B A* repreſent the Breadth of a Moat or Ditch, and the Perpendicular *B C* repreſent the Height of a Caſtle, Tower, or City Wall; and the Hypothenuſe, or longeſt Side, repreſent the Length of a Scaling-Ladder.

In this Figure, the Baſe *A B* is ſuppoſed to contain 40 Yards; and the Perpendicular, or Height of the Tower or Wall, 30 Yards; What Length will the Hypothenuſe *AC*, or the Scaling Ladder, be?

Rule. The Square Root of the Sum of the Squares of the Baſe and Perpendicular, is the Length of the Hypothenuſe as *per* Work.

1600 the Square of the Baſe 40.
900 the Square of the Perpendicular 30.
————
The Sum 2500 (50 Yards the Root or Length of the Scaling-Ladder.
. .
25
————
(0)

And if the Length of the Baſe, or Breadth of the Ditch were required; then the Square Root of the Difference of the Squares of the Hypothenuſe and Perpendicular is the Length of the Baſe, or Breadth of the Ditch or Moat. Example *per* Work.

2500 the Square of the Hypothen. *A. C.*
900 the Square of the Perpend. *B. C.*
————
The Differ. 1600 (40 Yards the Root or Breadth of the Ditch.
. .
16
————
(0)

And if the Height of the Tower or Perpendicular *B C* were required; then the Square Root of the Difference of the Diſtance of the Square of the Hypothenuſe and Baſe, is the Heigth of the Perpendicular *B C*, repreſenting a Tower, a Wall, Steeple, or any thing elſe.

Again, Any Number of Men given to be formed into a Square Battalia, to find the Number of Rank and File.

Rule. The Square Root of the Number of Men given, will be the Number of Men to be placed in Rank and File.

Example. Admit an Army of 32400 Men were to be formed into a ſquare Battalia; the ſquare Root of 32400 will be found 180; and ſo many Men muſt be placed in Rank, and alſo in File.

The Uſes of the Cube Root are to find out a Proportion between like Solids, as Globes, Cylinders, Cubes, *&c.*

Example.

Suppoſe a Bullet of 8 Inches Diameter weigh 72 Pound, what will a Bullet weigh whoſe Diameter is 4 Inches?

Rule. Since like Solids are in Triple Proportion to their Sides, Diameter, Lines, &c. it holds. As the Cube of the Diameter given is to the Weight thereof, ſo is the Cube of the Diameter ſought, to the Weight thereof: as *per* Work.

C D. *lb.* *C D.*
If 512———72———64
64

288
432

512) 4608 (9 Pounds.
4608

(0)

Example 2.

If a Ship of 100 Tuns be 44 Foot long at the Keel, o what Length muſt the Keel be of a Ship that carries 220 Tuns?

Say, as 120 is to the Cube of 44, that is, 85184; ſo is 280 to 1874048; whoſe Cube Root is 57,225 the Length of the Keel ſought.

Example 3.

There is a Cubical Veſſel whoſe Side is 12 Inches, and it is required to find the Side of a Veſſel that holds three times as much. Here the Cube of 12 is 1728, which multiplied by———————3

produces———————5184
and the Cube Root of which is 17,306 the *Anſwer* required, or Side ſought.

An eaſy Rule to find the Length of the Maſts of a Ship, viz.

Two thirds of the Length of the Keel, and the Breadth of the Beam, is the Length of the Main-maſt; and the Rule is therefore, to multiply the Length of the Keel by 2, and to divide the Product by 5, and then to the Quotient add the Breadth of the Beam, and the Total is the Length of the Main-maſt.

Ex-

Example.

Suppoſe a Ship to be 108 Foot by the Keel, and 40 Foot by the Beam, what is the Length of her Main-maſt?

108
2
3) 216
Add { 72 two thirds of the Keel.
40 the Breadth of the Beam.
Anſwer 112

Anſwer, The Length of her Main-maſt is 112 Foot as in the Work.

Again.

Admit a Ship to be 84 Foot by the Keel, and 31 Foot by the Beam, what is the Length of her Main-maſt?

84 *per* Keel.
2
3) 168
Add { 56 two thirds of the Keel.
31 the Breadth of the Beam.
Anſwer, 87 Foot, the Length of the Main-maſt

If you divide firſt by 3, and then multiply the Quotient by 2, it gives the two thirds of any thing, as well as the other way.

Another Way to find the Length and Thickneſs of Maſts and Yards, viz.

The Way to find the Length of the Main-maſt, is to add the Breadth of the Beam, and the Depth of the Hold together, and divide the Total by 1,5 and the Quotient will be the Length of the Main-maſt in Yards.

Example.

Admit a Ship whoſe Keel in Length is 73 Foot, and the Breadth of the Beam 28,5 Foot, and the Depth of the Hold 12 Foot; what is the Length of the Main-maſt?

Foot.
28,5 Breadth of the Beam.
12,0 Depth of the Hold.

1,5) 40,5 (27 Yards *Anſwer.*
30

105
105

(0)

Anſwer, 27 Yards, or 81 Foot, as *per* Work.

Or if, inſtead of Dividing, you multiply by this Multiplier, *viz.* ,6666 and point off the Decimals, you will have the ſame Anſwer.

Example.

40,5
,6666

33330
266640

26,99730

Here the Anſwer is 26 Yards and $\frac{99}{100}$ of a Yard, not wanting one Second to make it 27 Yards, as before.

I here multiply the under by the upper Number to ſave both Figures and Room.

To find the Thickneſs of the Maſt, having the Length, ſay, by the Rule of Proportion (or Rule of Three) If 84 Foot long require 28 Inches thick, what 81 Foot long? as in the following Work.

F. I. —— *In. thick.* —— *F. I.*
If 84 —— 28 —— 81
28

648
162

84) 2268 (27 Inches thick Anſwer.
168

588
588

(0)

By *Trigonometry*, or the Doctrine of Triangles, are a Multitude of Queſtions ſolv'd, relating to Sailing on the Seas; to give one Inſtance. Suppoſe two Ships ſet ſail at one Time, from one Place, the one ſailing directly Eaſt 48 Leagues, as from *C* to *B*; and the other directly North, as from *C* to *A*, 36 Leagues; the Queſtion is, how many Leagues are they diſtant or aſunder one from the other?

48 multiplied by 48, produces ———————2304
36 multiplied by 36, gives ————————-1296

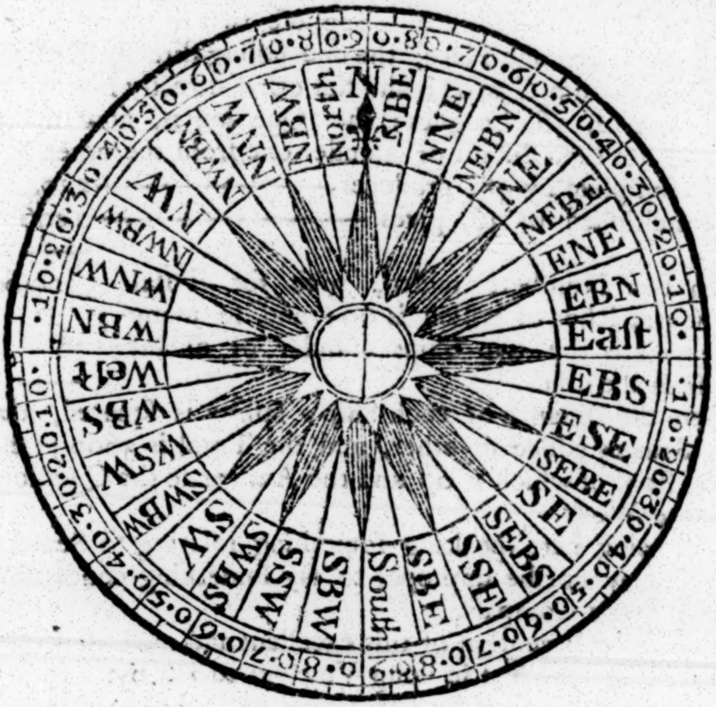
which two Numbers added, give for Total 3600(60
the ſquare Root of which is 60; and ſo many Leagues are the two Ships aſunder or diſtant one from the other. 36

Here the Diſtance of each Ship's ſailing is ſquared, and their Squares added together, and the Total is 3600; the ſquare Root of which is 60, and the Anſwer to the Queſtion, as in the Work.

And being here ſpeaking ſomething relating to Sea Affairs, it may not be improper to ſay ſomething concerning the Mariner's Compaſs.

Before the Invention of this excellent and moſt uſeful Inſtrument, it was uſual in long Voyages to ſail by, or keep along the Coaſt, or at leaſt to have it in Sight; as is manifeſt and plainly evident, by the Voyages of St. *Paul*, *Acts* xx, 12, and 27; which Courſe made their Voyages long, and very dangerous, by being ſo near the Shore. But now, by the help of a Needle touched by the Magnet or Loadſtone, which by a wonderful and hidden Quality, inclines its Point always Northerly, the ingenious Mariner is directed in his proper Courſe of Sailing, through the vaſt Ocean, and unfathomable Depths, to his intended Port: And if the Wind is favourable, can ſail near 333 Leagues, or 1000 Miles in a Week, tho' in the darkeſt Weather, or darkeſt Night, when neither Land, Moon, nor Stars, are to be ſeen; which before, were the only Guide; and, if not ſeen, the Sailors were at great Loſs, and expoſed to the moſt imminent Danger.

Behold the Figure or Repreſentation of the ſaid Compaſs, with the Cardinal and other Winds, as followeth.

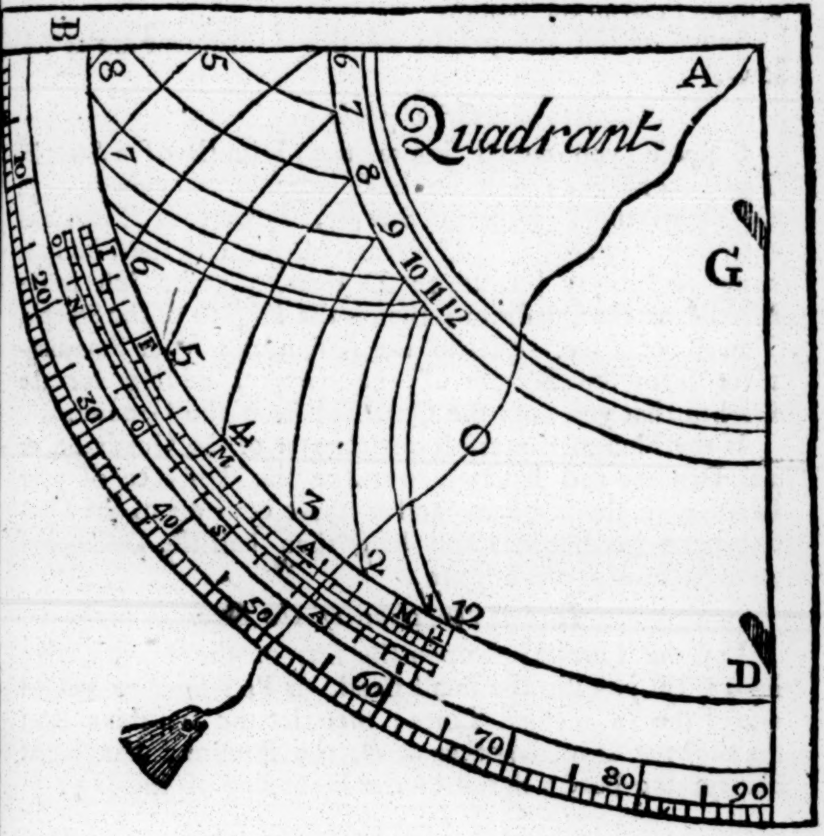


The Deſcription.

1ſt. The Needle in the Centre points with its principal End to the *Flower-de-Luce,* and ſhews its Direction Northerly, and the ſaid *Flower-de-Luce* is alſo placed in Maps to the ſame intended Purpoſe.

2dly. The Letters *N* by *E* on the Right of the ſaid *Flower-de-Luce,* ſignifies, and is to be read, *North by Eaſt*; and the next after it *N N E.* that is, *North North-Eaſt*; and the next *N. E. by N.* to be read *North Eaſt by North*; and ſo round the Circumference, which Mariners uſually have by-heart, particularly the Pilot, who guides the Ship accordingly; and ſometimes he is helped by the Sight of the North Pole Star, when on this Side the Equator; and by the South Pole, on the other Side.

The next Thing I ſhall proceed to, is to ſay ſomething in relation to the Art of Making Dials: But it may, and is very proper, to deſcribe and ſpeak of the Uſe of a very neceſſary Inſtrument called a *Quadrant*, the Shape of which is here repreſented,



This Quadrant, or Quarter of a Circle, is variouſly uſeful on ſundry Accounts, *viz.* to take Highths and Diſtances, whether acceſſible or inacceſſible: To find the Hour of the Day, *&c.*

Its Deſcription.

The outward Arch is divided into 90 Parts or Degrees, (being the fourth Part of the Circle of the Sphere) and figur'd from 10, 20, *&c*, to 90; above which Figures, are Letters ſignifying the 12 Calendar Months of the Year, as *J.* for *January*, *F.* for *February*, &c. And again, over thoſe Letters for the Months, are Lines to know the Hour of the Day; And upon the Line *G D*, are Sights of thin Braſs to be ſpied through, or for the Sun to ſhine through, from one to the other. Laſtly, in the Middle, or Point of the Quadrant, *viz.* at *A*, is a Line or Thread of Silk fixed, through a Hole with a Plummet of Lead at the End of it, and alſo a ſmall Bead in the Middle.

Some of the many Uſes of this Inſtrument are as follows.

Of Highths.

Suppoſe you would know the Highth of a Steeple, Tower, or Tree; hold up the Quadrant, and view through the Sights the Top of the Steeple, Tower, or Tree, and then ſtep forwards or backwards, till you find the Plummet hang at Liberty juſt at 45 Degrees, that is, juſt in the Middle of the Quadrant; then is the Highth of the Steeple, Tower, or Tree, equal to the Diſtance of your Standing-place from the Bottom of the Steeple, adding for the Highth that you hold the Quadrant from the Ground.

If the Plummet interſect one quarter of the Quadrant, or 22 Degrees and half, then twice the Diſtance of your ſtanding is the Highth; and if three quarters of the Quadrant, or 67 Degrees and half, then half the Diſtance of your ſtanding is the Highth.

To find the Hour of the Day.

Lay the Thread juſt upon the Day of the Month, then hold it till you ſlip the ſmall Bead, or Pins-head to reſt on one of the 12 o'clock Lines; then let the Sun ſhine from the Sight at *G* to the other at *D*, the Plummet hanging at liberty, the Bead will reſt on the Hour-line of the Day.

To find the Latitude of a Place.

Hold up the Quadrant, and thro' the Sights thereof, (or along the Edge) ſpy (in a clear Star-light Night) the North-Pole Star; the Plummet hanging at liberty, the Thread will reſt on the Degrees of Latitude of the Place you be in, or where you take your Obſervation: If at *London*, you will find it 51 Degrees and 32 Minutes: If at *Briſtol*, 51 Degrees 27 Minutes: If at *York*, 53 Degrees 58 Minutes: And if at *Berwick*, 55 Degrees 54 Minutes, *&c.*

When it is ſaid that ſuch a Kingdom, Country, City, Town, or Place, lieth from 40 to 50 Degrees North Latitude, it is to be underſtood, that it lieth on the North Side of the Tropick of *Cancer*, or North Boundary of the Sun towards us of *England*, to which the Sun comes about the

10th or 11th of *June*, and makes our Days the longeſt: And about the 10th or 11th Day of *December*, the Sun enters the Tropick of *Capricorn*, its South Boundary, and is then the fartheſt from us, and makes our Days the ſhorteſt.

Of Dialling.

Dialling is a very ancient Art, even as old as the Time of King *Hezekiah*, where mention is made of the Dial of *Ahaz*, in the 2d Book of *Kings*, Chap xx. verſe 11.

The Gnomon or Subſtile of a Poſt or Horizontal Dial, ſhould point directly South, and its Back will be then directly North. The South may be truly known by a good Watch or Clock, juſt at Noon; for then the Sun is always at the Meridian; and makes juſt 12 o'Clock; ſo that knowing the South, it will not be difficult to find the North, it being its Oppoſite.

To fix a Dial North and South.

Faſten your Board on the Top of a Poſt, and then with your Compaſſes make 4, or 5, or 6 Circles, one within the other, from the Centre or Middle, where place a large Pin perpendicular or upright, and nicely obſerve, when the Sun ſhines in the Forenoon, on which Circle the Head of the Pin ſhadoweth; then there make a Mark; and do the ſame in the Afternoon, when the Shade of the Pin's-Head comes on the ſame Circle; and from the Midway of the two Marks, draw a Line to the Centre, on which place your Meridian or 12 o'Clock Line: So will the Poſt Dial point North and South.

By the Meridian Line, you may alſo know when the Moon, or a Star of Magnitude, comes to the South; which when they do, they are always at the Higheſt, whether by Night or Day.

Before the Figures or Repreſentations of Dials, it may not be amiſs to give the Senſe and Meaning of ſome few Terms uſed in Dialling, Geography, &c.

Horizontal, belonging to the Horizon; which is that Circle that terminates the Sky, and a Boundary to our Sight, and divides the Upper Hemiſphere from the Lower, being the Line in which the Sun always riſes and ſets.

Equinoctial Line, or *Equator*, A Line going through the Middle of the World, and equally diſtant both from the North and South Poles, in which Line the Sun circleth on the 10th of *March*, and 10th of *Sept.* and then makes the Days and Nights of equal Length.

Tropicks, are two imaginary Circles on the Globe, for the Bounds of the Sun's Courſe; as was ſpoken of before.

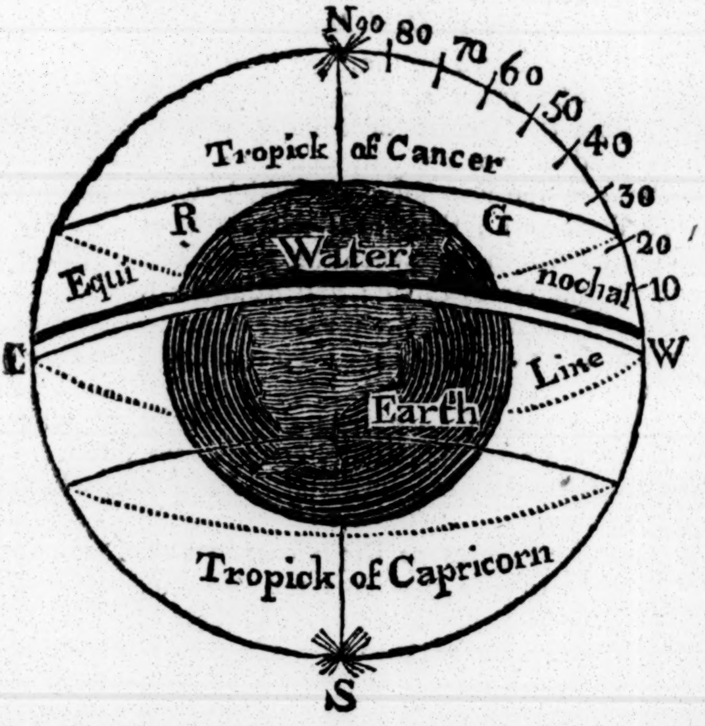
Meridian, Another imaginary Circle paſſing through the Poles and the Zenith, and being touched by the Sun makes Noon-day.

Zenith, Is the Point directly over our Heads.

Nadir, Is the Point oppoſite to the *Zenith*, and directly under our Feet.

Zodiack, another imaginary Circle in the Globe, containing the Yearly Courſe of the Sun through the twelve Signs, viz. *Aries*, *Taurus*, *Gemini*, *Cancer*, *Leo*, *Virgo*, *Libra*, *Scorpio*, *Sagittarius*, *Capricornus*, *Aquarius* and *Piſces*.

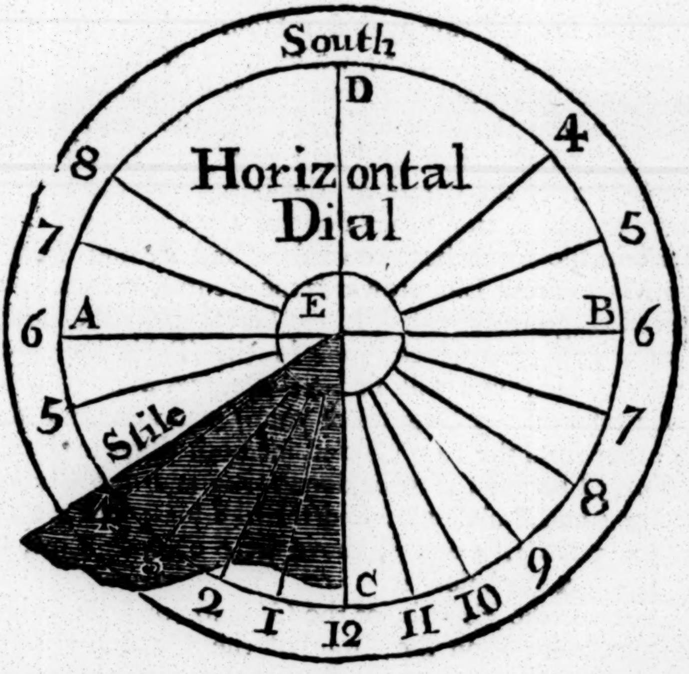
A ſmall Repreſentation of the Globe.



In this Figure, the middle Line is the Equinoctial or Equator; the upper, the Tropick of *Cancer*; and the under Line the Tropick of *Capricorn*, ſpoken of before; the Line noted N. W. is a Quarter of the World, and divided into Degrees from 10 to 90, and is a Quadrant, every Degree on the Surface being accounted 60 Miles; and if you multiply 90, the Quadrant or Quarter of the Globe, by 60, the Product will be 5400; which multiplied by 4 gives 21600 Miles for the Circumference of the whole Globe of the Earth and Sea.

The North and South Poles are fixed Stars, never varying from their Places; but their Elevation alters, according to your being nearer or farther from them. From one of theſe Pole-Stars to the other, there is an imaginary Line ſuppoſed to paſs through the Centre of the Globe, and called the Axis, or Axle-tree of the World; round which, and alſo about the Earth, the Sun appears to circle every 24 Hours.

But to return to Dialing, the following Figure repreſents a Horizontal Dial.



Firſt, with a Ruler draw the Line *A B*, then croſs it in the Centre with another Line, as the Line *C D*, which is the Meridian or 12 o'clock Line; and the firſt Line drawn, *viz.* *A B*, is the 6 o'clock Line: Then open your Compaſſes and place one Foot at the Beginning of the Degrees, or the Arch Edge of your Quadrant, and extend the other Foot to 60 Degrees, and with that Extent place one Foot in the Centre of the Dial, at *E*, where the two firſt Lines draw croſs one another, and draw the Semi-circle *A C B*.

Next having the 12 o'Clock Line *E C*, to know what Diſtance muſt be ſet off from it, for 1 o'Clock and 11 o'Clock being all one; be directed by the following ſmall Table, *viz.*

52			
D.	M	Hours.	
11	55	1	11
24	26	2	10
38	13	3	9
53	44	4	8
71	9	5	7

In the firſt Column againſt 1 Hour and 11, you find 11 Degrees and 55 Minutes; which take off the Edge of the Quadrant, by ſetting one Foot of the Compaſſes at the Beginning of the Diviſions under *B*, and the other Foot to 11 Degrees and near a ſmall Part; the Compaſſes ſo opened, at one Foot in the Circle at the Bottom of the 12 o'Clock Line, and with the other Foot of the Compaſſes make a Mark in the Circle both towards *A* and *B*, and from thoſe two Marks draw Lines towards the Centre, which you may afterwards go over with Ink. Then to make the Hour-lines from 2 and 10 o'Clock, look in the Table for 2 and 10 Hours, which you will find 24 Degrees and 26 Minutes, which take off the Degrees of your Quadrant, and mark as the other from the 12 o'Clock Line both Ways in the Circle.

Note, The ſame is to be done for 3 and 9 o'Clock, and alſo for 4 and 8 o'Clock; and the like for 5 and 7 o'Clock; and for 5 and 7, 4 and 8, above the 6 o'Clock Line, ſet off the Diſtances as below it.

Then for the Highth, of the Gnomon or Stile, admit 52 Degrees, take it off the Edge of the Quadrant with the Compaſſes as before, and with that Extent ſet one Foot at Bottom of the 12 o'Clock Line, as before, and extend the other Foot in the Circle, and make a Mark, and then draw a Line from thence to *E* the Centre, for the upper Edge of the Stile, and ſo raiſe it directly over the Meridian or 12 o'Clock Line.

Before I proceed farther, two or three Things ſhould be ſhewn, as being eſſentially neceſſary to be known, becauſe this Art hath great Dependance on them. And firſt,

Upon a Right Line given to erect a Perpendicular, as in Figure the 14th.

Let *C D* be the Line given to have a Perpendicular on it from *B*, with the Compaſſes (open'd at a ſmall convenient Diſtance) place one Foot in the Point *B*, and with the other make the two Marks *E* and *F*, on either Side of *B*; then open the Compaſſes to a more large and convenient Diſtance and make the Arch *GG*, by ſetting one Foot in *E*, and as near as you can over the Point *B*; then (the Compaſſes being open at the ſame Diſtance) place one Foot on the Point *F*, and deſcribe the Arch *H H*, croſſing the former at the Point *A*; through which Interſection with a Ruler draw the Line from *A* to *B*, which will be perpendicular to the Line *C D*.

How to raiſe a Perpendicular on the End of a Line.

This is effected ſeveral Ways; but I ſhall inſtance only two, which are very eaſy.——See Figure 15.

Firſt Method.

Suppoſe the Line *A B* be given to raiſe a Perpendicular towards the End.

Firſt, open your Compaſſes to any ſmall Diſtance, and ſet one Foot in the Point *A*; and with the other, deſcribe the Arch *F E D*; then with one Foot of the Compaſſes in *D* (they being opened to the ſame Diſtance) croſs the Arch in *E*; and then ſetting one Foot in *E*, with the other make the Arch *A F G*, croſſing the firſt Arch in *F*. Again, ſet one Foot in *F*, and with the other deſcribe the ſmall Arch *H H*, croſſing the former in the Point *C*; ſo the Line *A C* being drawn, is the Perpendicular required.

The Second Method.

Admit *B* be the Point given on which to draw the Perpendicular *B I*. Open the Compaſſes to any ſmall Diſtance; and ſetting one Foot on the Point *B*, pitch down the other Foot at random, as ſuppoſe at *K*; then the Foot reſting in *K*, turn the other about till it croſs the Line *A B* in *L*; then draw the Line *K L*, and ſet the ſame Diſtance *K L* (at which the Compaſſes already ſtand) from *K* to *M*;

ſo a Line drawn from *B*, through *M*, is the Perpendicular on the End of the Line *A B*.

How to divide a Right Line into two equal Parts, and at Right Angles; as in Figure the 16th.

Suppoſe the Line *A B* be given to be divided into equal Parts, at Right Angles. Take in the Compaſſes any Diſtance above half the Length of *A B*, and ſetting one Foot in the Point *A*, with the other draw the Arch *C D E*; then (the Compaſſes unaltered) ſet one Foot in *B*, and with the other croſs the former Arch both above and below the Line, in the Points *F* and *G*; then a Line drawn from *F* to *G* ſhall interſect, or cut the given Line in *H*, and divide the Line *A B* into equal Parts, and at Right Angles.

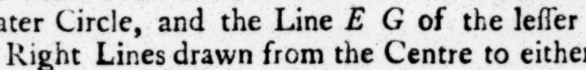
Again, *A Line being given, how to draw another Line parallel thereunto, at any Diſtance required, or through any Point aſſigned.*

Of parallel Lines there are two Sorts, viz. *Straight* or *Circular*. All Circles drawn on the ſame Centre, whether greater or leſſer one than the other, are ſaid to be Parallel or Concentrick, that is, having one common Centre, as in Figure the 17th.

In this Figure, the Circle *A B C D* is concentrick or parallel to the Circle *E F G H*, becauſe both of them are drawn from the ſame Centre. The Line *A C* is the Diameter of the greater Circle, and the Line *E G* of the leſſer Circle. And all Right Lines drawn from the Centre to either of the Circumferences, are equal with Reſpect to their Periphery; and ſuch Lines are called half Diameters, and ſometimes the Radius of the Circle, and will divide the Circle into 6 equal Parts, each containing 60 Degrees, and the whole Circle 360; into which all the great Circles of the Sphere are ſuppoſed to be divided.

Of Parallel Right Lines.

Right-lined Parallels, are Lines drawn on a Plane of equal Length and Diſtance; and tho' infinitely extended will never meet, and in all Parts retain an equal Diſtance, ſuch as theſe underneath,



To draw a Right Line parallel to another Right Line, at a Diſtance given: as in Figure the 18th.

Take in your Compaſſes the given Diſtance *G H*, then ſetting one Foot in *E*, draw the Arch *I K*; then moving to *F*, deſcribe the Arch *L M*; then laying a Ruler on the Top of the two Arches, juſt touching them, draw the Line *N O*, which will be parallel to the given Line *E F*.

To bring any three Points (not in a ſtraight Line) into a Circle, by finding the Centre, ſo that the Circle ſhall paſs thro' thoſe Points: as in Figure the 19th.

Let the three Points given be *A*, *B*, and *C*, through which it is required that a Circle be drawn. Firſt, ſet one Foot of the Compaſſes in one of the given Points, as ſuppoſe in *A*, and extend the other Point to *B*, another of the Points, and draw the Arch of a Circle *G F D*; then (the Compaſſes not altered) ſet one Foot in *B*, and with the other croſs the ſaid Arch with two ſmall Arches, in the Points *D* and *E*, and draw the Line *D E*. Thirdly, Set one Foot in *C*, (the Compaſſes being at the ſame Diſtance) and with the other Foot croſs the firſt Arch *G F D* in the Points *F* and *G*, and draw the Line *F G*, croſſing the Line *D E* in the Point *O*, which is the Centre ſought for; in which, place one Foot of the Compaſſes, and deſcribe the Circle at the Diſtance *O A*, and it paſſes through all the given Points *A*, *B*, and *C*.

How to make a Line of Chords Geometrically to any aſſign'd Length or Radius.

Since in the Art of Dialling, there is frequent Uſe made of the Line of Chords, it is proper here to ſhew the making thereof.

A Line of Chords is 90 Degrees of the Arch of a Circle, transferred from the Limb of the Circle to a ſtraight Line; now every Circle, whether Great or Small, is divided (or ſuppoſed ſo to be) into 360 equal Parts, called Degrees: So the Semi or half Circle contains 180, the Quadrant or Quarter 90, and the Radius or Semi-diameter (which is that Line on which the Circle or Semi-circle is drawn or deſcribed) noted in Figure the 20th of the *Line of Chords*, with the Letters *A B*, is always equal to 60 Degrees of that Circle which it deſcribes, and therefore 60 Degrees of a Line of Chords is called the Radius thereof.

To make the Line of Chords; as in Figure the 20th.

Firſt draw a Line of any Length, as *C B D*, and on the Middle thereof draw the Perpendicular *A B*; next open your Compaſſes to the Radius or Length that you would have your Line of Chords be of; which admit *A B*, and with that Diſtance on *B* as the Centre, deſcribe or draw the Semicircle *C A D*, which is divided into two equal Parts or Quadrants by the Perpendicular Line *A B*; thirdly, divide the Arch or Quadrant *A R D*, into 90 equal Parts or Degrees; which is done by taking the Length of the Line *A B*, and ſetting that Diſtance on the Quadrant *A D*, and from *D* to *R*; ſo is *D R* 60 Degrees, and *A R* 30 Degrees; then take the Diſtance *A R*, and ſet it from *D* to *S*, ſo is the Quadrant divided into three equal Parts, at the Point *S* and *R*, each containing 30 Degrees: This done, divide the ſeveral Spaces between *A R*, *R S* and *S D*, into three equal Parts, each of which will be 10 Degrees according as the Numbers are ſeen and ſet apart to them: And theſe again divided into two equal Parts, each Part contains 5 Degrees; and every of thoſe into five ſmaller, as in the Repreſentation; and ſo the whole Quadrant is divided into 90 Degrees. Fourthly, the Quadrant *A R S D* being thus divided into 90 Degrees, ſet one Foot of the Compaſſes in *D*, and open the Foot to *A*, and deſcribe the Arch *A E F*, touching the Line *C D* in *F*, ſo is the Point *F*, upon the Right Line *C D*, the Chord of 90 Degrees. Fifthly, Open the Compaſſes from *D* to 80 Degrees, and deſcribe the Arch 80 *G H*; ſo ſhall the Point *H* be the Chord of 80 Degrees. Sixthly, Open the Compaſſes from *D* to 70, deſcribe the Arch 70 *I K*, ſo is *K* the Chord of 70 Degrees. Again, Open the Compaſſes from *D* to *R*, the Radius or 60 Degrees, and deſcribe the Arch *R L B*, ſo is *B* the Chord of 60 Degrees, equal to the Radius. Do the ſame by 50, 40, 30, 20, and 10, and then you will have the Line *D F* divided into 90 unequal Parts, called Chords, as in Figure 20.

Thus much for the Line of Chords, frequently made uſe of in Dialing, where there is not the Conveniency of having a Mathematical Inſtrument-maker near at hand.

Note, *A Degree is the 360th Part of the Globe, or of any Circle; each of which Degrees is ſuppoſed to be divided into 60 Parts, called Minutes; ſo that* 45 *Minutes is three*

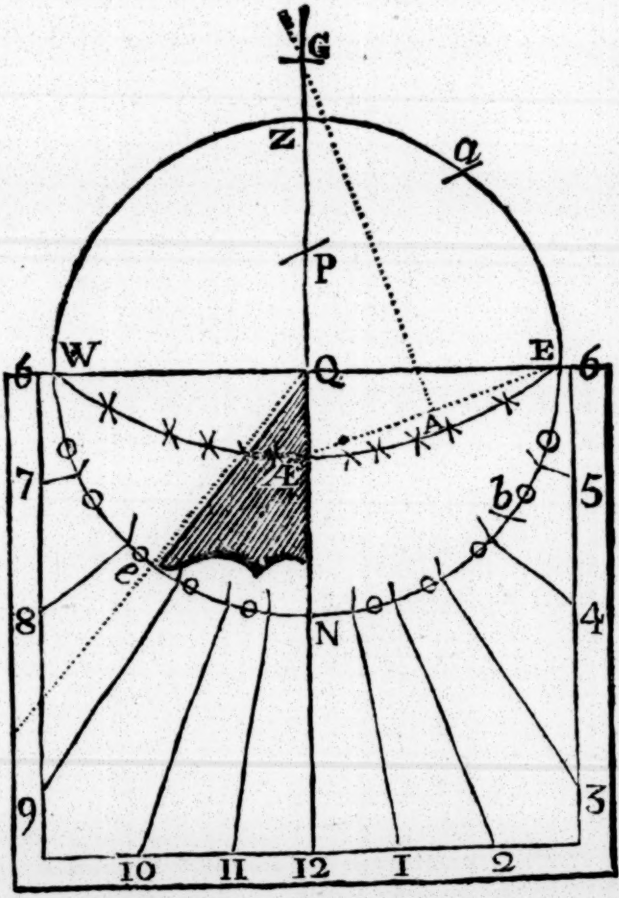
Quarters of a Degree, and 30 Minutes half a Degree, and 15 Minutes one Quarter of a Degree, &c.

Of Upright Planes.

THOSE Planes are ſaid to be Erect or Upright which ſtand perpendicular to the Horizon of the Place, whoſe upper Part pointeth to the Zenith, and their lower Part to the Nadir; and ſuch are the Walls of Houſes, Churches, Steeples, *&c.* againſt which Dials are commonly made.

Of upright or erect Planes, there are two Sorts, *viz. Direct* and *Declining*.

How to draw the Hour Lines on a Direct South Plane, in the Latitude of 51 Deg. 32 Min. as deſcribed by the following Repreſentation.



Firſt draw the Circle *Z E W N*, repreſenting an upright direct South Plane; next croſs it with the Diameters *Z Q N*, for the Meridian or 12 o'clock Line; and *W Q E* for the prime vertical Circle, or Hour-line of Six.

Secondly, out of your Line of Chords take 38 Degrees 28 Minutes, (the Compliment of the Latitude of the Place) and ſet that Diſtance on the Dial-plane from *Z* to *a*, and from *E* to *b*, and from *N* to *c*.

Thirdly, Lay a Ruler from *W* to *a*, and it will cut the Meridian Z *N* in the Point *P*, the Pole of the World; and a Ruler alſo laid from *W* to *b* will cut the Meridian in *Æ*, which is the Point thro' which the Equinoctial muſt paſs; for the drawing of which, you have 3 Points given, *viz.* *E Æ* and *W*, and the Centre will always be in the Meridian Line Z *N*.

Fourthly, Divide the Semi-circle *E N W* into 12 equal Parts, as the Points *O O O*, *&c.*

Fifthly, Lay a Ruler to *Q* and each of thoſe Points *O O O*, and the Ruler will croſs the Equinoctial Circle in the Points * * * *&c.* dividing that into 12 unequal Parts.

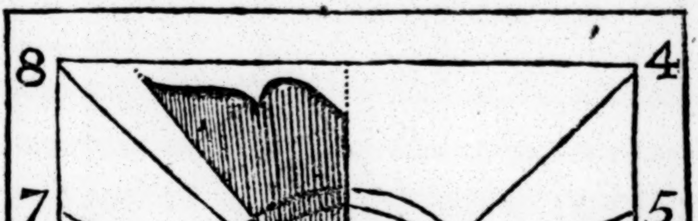
Sixthly, Lay a Ruler to *P* (the Pole of the World) and every one of the Marks * * * *&c.* and the Ruler will croſs the Circle of the Plane in the Points | | | *&c.*

Laſtly, If through the Centre *Q* and the reſpective Points | | | *&c.* you draw right Lines, they will be true Hour-lines of an erect South-plane.

For the Gnomon or Stile, take 38 Deg. 28 Min. out of the Line of Chords, and ſet them from *N* to *e*, drawing the Line *Q e* for the Axis of the Stile, which muſt hang directly over the Meridian or Hour-line of 12, and points downwards to the South-pole, becauſe the Plane beholds the South Part of the Meridian,

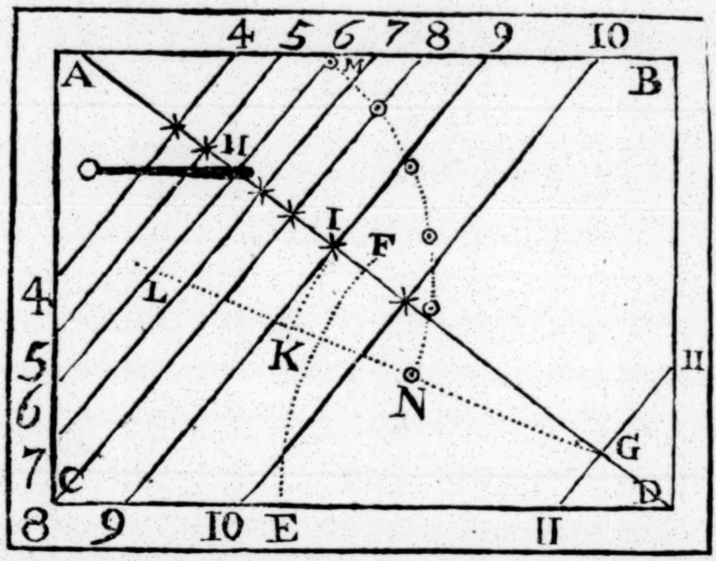
In making this Dial, you make two Dials; for the Erect Direct North Dial, is but the Back-ſide of the South; for as this beholdeth the South Part of the Meridian, ſo the other faceth the North Part of the Meridian; and as the Meridian Line in the South Dial ſhews when it is 12 o'Clock at Noon, ſo the Back-ſide thereof, *viz.* the North-ſide, repreſents the Hour-line of 12 o'Clock at Midnight, and therefore not expreſſed, nor the Hour-lines of 9, 10, 11 at Night, or of 1, *2*, or 3 in the Morning, the Sun being never ſeen by us above the Horizon at thoſe Hours: So that the North Dial is capable of only receiving the Hours of 4, 5, 6, 7 and 8 in the Morning, and 4, 5, 6, 7 and 8 at Night, and (in this Latitude) not all of them neither; for it ſhines not in this Plane at 8 in the Morning, nor at 4 in the Afternoon; but it is beſt to put them down, as in the Figure ſollowing, to know how much it is paſt 7 in the Morning, and what it wants of 5 in the Afternoon.

An Erect Direct North Dial.



To draw the Hour-lines on an erect direct Eaſt or Weſt Plane. ——Hour-lines in theſe Dials muſt be parallel to one another, and the Dial not have any Centre, but drawn as follows.

An Eaſt direct Dial, in the Latitnde of 51 *Deg.* 32 *Min*



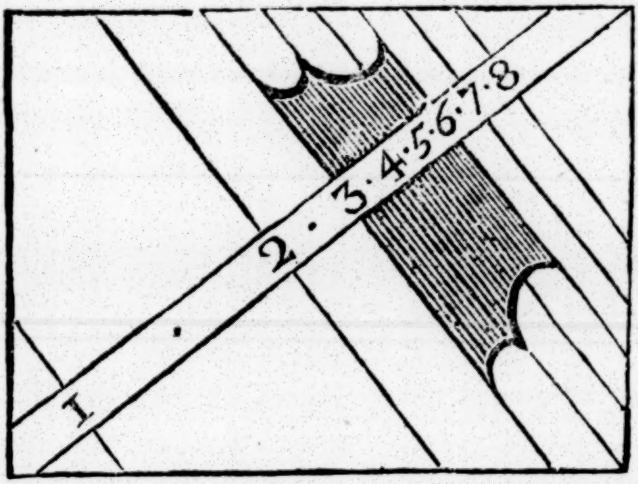
Let *A B C D* be the Dial Plane, on which is to be drawn a direct Eaſt Dial, upon the Point *D*, if an Eaſt Dial; and on the Point *C*, if a Weſt. With the Radius (or 60 Degrees) of the Line of Chords, deſcribe the obſcure Arch *E F*; then from your Chords take 38 Deg. 28 Min. the Complement of the Latitude of the Place, and ſet them from *E* to *F*, and draw the Line *D F* quite through the Plane; then that you may proportion the Stile to the Plane, ſo that you may bring on all the Hours from Sun-riſing to 11 o'Clock, aſſume two Points in the Line *F D*, one towards the End *D* (as the Point *G*) for the Hour Line of 11, and another at *H*, for the Hour Line of 6; and thro' the Points *G* and *H*, draw the Lines 11 *G* 11, and 6 *H* 6, in the Point *L*; ſo ſhall *L H* be of the Height of the Perpendicular Stile proportioned to this Plane.

For the drawing of the Hour-lines, ſet one Foot of the Compaſſes (opened to 60 Degrees of the Chords) in *L*, and with the other deſcribe the Arch *M N*, between the Hour-line of 6, and the Line *G L*; which divide into five equal Parts in the Points ⊙ ⊙ ⊙ ⊙ ⊙ and a Ruler laid from the Point *L*, to each of theſe Points ⊙ ⊙ ⊙ *&c.* will cut the Equinoctial Line *H L* in the Points *****; thro' which

Points draw Lines parallel to 6 *H* 6, as the Lines 7 * 7, 8 * 8, *&c.* as may be ſeen in the Figure.

And thus you have made two Dials, *viz.* a Weſt Dial as well as an Eaſt; only the Arch *E F*, through which the Equinoctial paſſeth in the Eaſt Dial, is drawn on the Right-hand of the Plane; but in the Weſt it muſt be drawn on the Left; and the Hour-Lines 4, 5, 6, 7, 8 9, 10, and 11, in the Forenoon, on the Eaſt Dial muſt be 8, 7, 6, 5, 4, 3, 2, and 1 in the Afternoon, upon the Weſt Dial, as in the Figure.

An erect and direct Weſt Dial.



The Stile of the Eaſt or Weſt Dials, may be either a ſtraight Pin of the juſt Length of the Line *H O* in the other Figure, which is equal to *H L* in the Eaſt Dial fixt in the Point *H*, on the Hour-line of 6, and exactly perpendicular to the Plane, ſhewing the Hours by the Shadow of the Apex, or very near the Top thereof: Or, it may be a Plate of Braſs of the ſame Breadth with the Diſtance of the Hour-lines of 6 and 3; which Plate muſt be ſet perpendicular upon the Hour-line of 6, and ſo it will ſhew the Hour by the Shadow of the upper Edge thereof, as in the foregoing Weſt Dial.

An eaſy Way how to fix a Dial North and South.

Fix a ſquare Piece of Board, like a Trencher, on the Top of a Poſt, and with your Compaſſes draw 4, 5, or 6 Circles one within another from the Centre; in which Centre fix a large Pin perpendicularly; and when the Sun ſhines in the

Forenoon, note which Circle the Pin's Head ſhadeth, and there make a Mark: Do ſo in the Afternoon when the Shadow of the Pin's Head comes on the ſame Line; and from the Midway of thoſe two Marks draw a Line to the Centre; upon which Line lay your 12 o'Clock or Meridian Line of your Poſt-Dial, becauſe it directly points North and South. Thus by this plain Way, without any other Inſtrument, find the Situation of your Dwelling, whether full North or South, or whether it declines Eaſt or Weſt, *&c.*

Of Beautifying and Colouring Dials.

FIRST, the Boards are to be bruſhed over with Linſeed Oil, thinly ground with Spaniſh Brown, done over three or four times (drying between each time) a little thicker each time with the Colour; and this is called *Priming.*

To make the Fat Oil for Dials.

Boil Red Lead, and Linſeed Oil, and a little Litherage of Gold, (about a Penny-worth) together, till almoſt as thick as Syrup; and when cold, and well ſettled, pour the cleareſt into a Bottle or Bladder for Uſe.

The Gold Size for Dials.

Mix fine ground yellow Oaker with the aforeſaid fat Oil, to ſuch a Conſiſtency, as when uſed, it may ſettle ſmooth of itſelf.

A Mixture for Hour-lines.

Grind Vermilion or Lamp-black with the Fat Oil.

To draw Golden Letters or Figures for the Hours.

Firſt draw them with a Pencil dipt in the Gold Size before mentioned; which when ſo dry as juſt to ſtick to your Fingers, then with a ſmooth-edg'd Pen-knife ſhape your Leaf-Gold to your Mind; take it up with a Piece of Cotton-Cloth fixt to the End of a Stick, and lay it on the Size, preſſing it down with the ſame Cotton, and, when dry, bruſh off the looſe Gold with a Feather, and ſmooth the rough Edges of the Letters with a Pencil dipped in red or black Colour.

Of the Dial Plain.

Let the Board be of the beſt ſeaſon'd, firmeſt, cleareſt Oak, one, two or more Foot ſquare, and about three Inches thick. Take two Boards, and get them planed on both Sides, and then laid in the Sun-ſhine, or near a moderate Fire 2 or 3 Days together; then plane them again, and fix them with good Joints; and faſten them in gluing with wooden Pegs, as I have ſeen Coopers fix their Pieces of Heading for their Caſks; and when thus glued and dried, plane them again, and then faſten them, by nailing two ſmall Plates of Iron or Tin on the Back. If you cannot get ſeaſoned Wood, but green, then boil it about an Hour in Water, to make it tough, and keep it from warping. In the general, Wood is accounted better than Stone, becauſe it keeps the Colouring more ſtanch or firm.

Before you colour your Dial-plate or Board, fix your Iron Stile of 38 Degrees (which indifferently ſerves for all *England*;) and having marked your Hour-lines with Ink, and faſtened a Nail at the End of each Hour-line, that the Head of each Nail may ſhadow or direct you to the Centre when it is coloured. And as it may happen that Golden Letters or Figures may decay in a few Years, you may on that Account make them with White-lead-paint, pointed with Red in a Black Margin.——When your Dial is finiſhed, and dry, dip a Feather in your Oil, and anoint it thinly; for the finer you mix or grind the Colouring with the Oil, the more beautiful it appears, though not ſo laſting.

Theſe Hints of Colouring Dials, puts me in mind of ſome other neceſſary Touches, relating to ſundry Mixtures of Colours, and dying of Stuffs, *&c.* collected from Mr. *Salmon*'s *Polygraphice.*

Of Colours, and Dying.

Whites, are Ceruſe, Flake-White, and White-lead.

Blacks, are Lamp-black, burnt Cherry ſtones, and old Ivory burnt.

Reds, are Red-lead, Vermilion, Red Oaker, and Indian Lake.

Greens, are Verdigreaſe, Verditure, and Sap-green, made of the Juice of Buckthorn-berries.

Yellows, are Saffron, yellow Pink, and Gambogia.

Brown, is Umber burnt.

Gold Colour, is Orpiment.

Again, *Verdigreaſe*, with a little Sap-green, makes a good and a right Green.

Blues, are Ultramarine, Smalt, Indico, and blue Bice.

Of mixing Colours.

Colours are mixt by being ground on a Stone with fair Water ſeverally, and dried, and kept in Paper Bags for uſe; except Lamp-black, Saffron, Smalt, Gambogia, and Sap-Green.

Blue; to compound, temper a little Indico and Smalt with Oil.

A light Blue; mix Smalt and White-lead together.

Red Colour, mix Lamp-black, and White-lead together, on a Marble.

A Fox Colour, is Umber burnt.

Gold Colour, is Orpiment mixt with fat Oil, by a Knife on an Earthen Plate, or Gally-Tile rather.

To hinder Colours from cracking, put Oil of Wallnuts to them.

Yellow Colour; beat Saffron to Powder, and ſteep it in Vinegar.—Or take the Yellow Chives in White Lillies and Gum-Water mixt for Writing.

Red; Vermilion with Gum Water mixt for Writing.

Golden Letters; to write, mix Vermilion and Gum-Armoniack with Yolks of Eggs.

Of Dying Wool, Stuffs, &c.

To dye *Blue*, Take Woad 1 Pound, and mix it with 4 Pints of boiling Water, and dip Whites in it 24 Hours.

To dye *Red* of a clear Colour, Take 60 Pints of Water wherein Brann has been ſteeped 24 Hours, and, when ſtrained, diſſolve 2 Pound of Allom, and 1 Pound of Tartar; in which Water boil what you have to dye for 2 Hours; then take it out, and boil it in half as much Freſh Water made of Brann, *viz.* 30 Pints; to which add Madder 3 Pound, and ſo perfect the Colour with moderate Warmth, without boiling.

To dye *Green*, Firſt make a Yellow by the Direction underneath; then take 60 Pints of Water wherein Brann hath been ſoaked, aforeſaid; then ſtrain it, let 3 Pound of Allom be diſſolved in it, and then boil what you have to dye in it, for two Hours,

To dye *Yellow*, Take Woad 2 Pound of the ſaid Water of Brann, and boil till the Colour is good.

And if you would have the ſaid *Yellow* to be *Green*, put the Stuff into the aforeſaid *Blue Lye*.

To dye a *Sad Colour*, add Logwood to the *Black Dye* before-mentioned.

To dye Linnen or Thread, *&c.* like Red: Take Powder of Brazil and Vermilion, of each 1 Ounce, boiled in Allom-water.

To dye Linnen or Thread Yellow; diſſolve Gambogia in Allom-water, *&c.*

To ſtain Skins Blue; Boil Eldern-Berries, and with the Liquor bruſh over the Skins, and wring them; then boil the Berries in Allom-water, and wet them twice over.

A Hint of Generals, or Things proper to be known and remember'd on proper Occaſions.

A Ream of Paper, 20 Quires.
A Quire of Paper, 24 or 25 Sheets.
A Bale of Paper, 10 Reams.
A Roll of Parchment, 5 Dozen, or 60 Skins.
A Dicker of Hides, 10 Skins.
Ditto of Gloves, 10 Dozen Pair.
A Laſt of Hides, 20 Dickers.
A Load of Timber unhewed, 40 Foot.
A Chaldron of Coals, 36 Buſhels.
A Hogſhead of Wine, 63 Gallons.
Ditto of Beer, 54 Gallons.
A Barrel of Beer, 36 Gallons.
Ditto of Ale, 32 Gallons.
A Groſs, 144 or 12 Dozen.
A Weigh of Cheeſe, 256 Pounds.
Days in a Year 365. Weeks 52, and Hours 8766.
Pence in a Pound 240, Farthings 960.
An Acre of Land 160 Square Poles or Perches.
A Laſt of Corn or Rape-Seed, 10 Quarters.
Ditto of Pot-Aſhes, Cod-fiſh, White-herrings, Meal, Pitch and Tarr, 12 Barrels.
Ditto of Flax and Feathers 17 C. of Gun-powder 24 Barrels, or 2400 lb. of Wool, 4368 lb.
A Tun of Wine, 252 Gallons: Oil of Greenland, 252 Gallons; and ſweet Oil of Genoa, 236 Gallons.
A Tun in Weight, 20 C. of Iron, *&c.* but of Lead there is but 19 C. and half, called a Fodder or Fother.
A Todd of Wool, 28 Pounds.

A Pack of ditto, 364 Pounds.
A Load of Bricks 500; and of Plain-Tiles, 1000.
A Stone of Fiſh, 8 lb. and of Wool 14 lb. The ſame for Horſeman's Weight, and alſo Hay; but Pepper, Cinnamon, and Allom, have but 13 lb. ½ to the Stone.
Ditto of Glaſs, 5 Pounds; and a Seam of ditto 24 Stone.
A Truſs of Hay, 56 Pounds; and a Load of ditto 39 Truſſes.

Note, *New* Hay *in* June *and* Auguſt, *ought to be* 60 *Pound to the Truſs; as per Statute of* 2 *of* William *and* Mary, 1693.

A Cade of Red Herrings, 500; and of Sprats, 1000.
Iron and Shot, 14 lb. to the Stone.

Barrels of Sundry Commodities.

Anchovies, 30 lb
A double Barrel, 60 lb.
Nuts or Apples, 3 Buſhels.
Pot-aſh or Barilla, 200 lb.
White or Black Plates, 300
Candles 10 doz. lb.
Salmon or Eels, 42 Gall.
Figs, 3 qrs. 14 lb. to 2 C. ¼
Raiſins, 1 C. wt.
Oil, 31 Gallons and half.
Spaniſh Tobacco, 2 C. to 3 C
Gun-powder, 1 C. wt.
Soap, 240 lb.
Butter, 224 lb.
Herrings, 32 Gallons.

Things in Wholeſale Trade, bought and ſold by the Thouſand.

Cuttle Bones.
Oranges and Lemons.
Chair Nails.
Tacks and Tenter Hooks.
Pomgranates and Tazels.
Gooſe Quills and Thimbles,
Bricks.
Clinkers, or Flanders Tiles.
Billets and Leaves of Horn.
Barrel Hoops.
Squirrel Skins.
Slat and Hilling Stones.
Pins and ſmall Needles, by the 1000 Dozen.

Things ſold and bought at Six Score to the Hundred.

Bauks and Barlings.
Barrel and Pipe Boards.
Bomſpars and Bow-ſtaves.
Canſpars and Caprevans.
Herrings and Deal Boards.
Nails, Eggs, and Cod-fiſh, Cole, Ling, and new Land-fiſh, Stock-fiſh of all ſorts.
Ells of Canvas, and moſt Foreign Linnens.
And Hhd Staves.

Of Money.

THE Current Coin of this Nation, is made either of Copper, Silver, or Gold. Of *Copper* is made the Farthings and Half-pence. Of *Silver*, the Pennies, Two-pences, Three-pences, Groats, Six-pences, Shillings, Half-crowns, and Crowns: But there is very little Silver coined below the Six-pence. Of *Gold* is made the Half-Guinea, the Guinea, and the 5 Guinea Piece: Beſides, there are Foreign Pieces of Gold, that paſs, tho' with ſome Scruple, as the *Portugueſe Moidore*, at 27*s.* Pieces of 36*s.* each; and others of 3*l.* 12*s.* and the Milled or *French Piſtole* at 18*s.* There are alſo ſome few ancient Pieces of Gold of a pale Colour, as being alloyed with Silver, and therefore may be reckoned the beſt, and ſometimes called Angel or Crown Gold; whereas the old Gold or Broad Pieces are moſtly alloyed with Copper, which makes them of a rediſh Colour.

Imaginary Money.

We appropriate ſeveral Names to Money, of which there is no Coin; as,

	s.	*d.*
The Pound of	20	0
The Mark	13	4
The Noble, or half Mark	06	8
The Angel,	10	0

In *England*, Accounts are kept in Pounds, Shillings, and Pence *Sterling*; and their Marks are derived from their Names in Latin, *viz. l.* for *Libræ* or Pounds, *s.* for *Solidi* or Shillings, *d.* for *Denarii* or Pence, *qr.* for *Quadrantes* or Farthings, 4 making a Penny; and expreſſed or ſet down thus,

l. *s.* *d.* *qr.*
4 16 8 2

but better thus, *l.* 4 — 16 — 8 $\frac{1}{2}$; the Mark for Pounds ſtanding before the Sum, denominates the firſt Number, and the others are known of courſe; for after Pounds follow Shillings, and after Shillings ſucceed Pence, *&c.* When the Price of any Thing is Shillings and Pence, it is ſet down thus,

s. *d.*
4 6

or thus, 4ſ6: And when Shillings and Pence, and Parts of a Penny, expreſſed thus,

s. *d.*
4 6 $\frac{1}{2}$

or thus, 4ſ6 $\frac{1}{2}$. The latter Way by ſome is accounted the nearer, and beſt Methods to expreſs Parts of a Penny or Farthings; thus,

0 $\frac{1}{4}$

$\frac{1}{4}$ a Farthing, or one fourth Part of what it follows.
$\frac{1}{2}$ a Half-penny, or one half of what it follows.
$\frac{3}{4}$ three Farthings, or 3-4ths, or qrs. of what it follows.

And being thus ſet Fraction-wiſe, the under Figure ſhews how many Parts the Quantity before it is divided into, and the upper Figure ſhews how many of thoſe under Parts the Fraction ſtands for; as thus, $\frac{1}{2}$ of an Ell, $\frac{3}{4}$ of a Foot, or 9 Inches; and the ſame of a Shilling is 9 Pence; of a Pound is 15 *s.*

If you are to ſet down 6 Yards and half, write thus, Yds. $6\frac{1}{2}$

Nineteen Hundred three Quarters thus, C $19\frac{3}{4}$

Sixteen Pounds and a quarter thus, ℔ $16\frac{1}{4}$

or elſe thus, 16 C $\frac{1}{4}$, 16 ℔ $\frac{1}{4}$, 5 Foot $\frac{1}{2}$, 14 Days $\frac{3}{4}$. Here the Name is put between the whole Number and the Fraction, which I think is the plainer and better way: For Example, $6\frac{1}{2}$ Hhd may through Ignorance or Wilfulneſs, be read, 6 half Hhds, as well as 6 Hhds and half; and at a certain Place where I have had Buſineſs, the Warfingers Clerks expreſſed their half Hhds in this manner.

A Table of the Value of Gold and Silver.

		l.	*s.*	*d.*
Gold	1 Pound is worth	48	0	0
	1 Ounce	4	0	0
	1 Penny Weight	0	4	0
	1 Grain	0	0	2
Silver	1 Pound is worth	3	0	0
	1 Ounce	0	5	0
	1 Penny Weight	0	0	3
	1 Grain	0	0	$\frac{1}{8}$

Inſtrumental Arithmetick.

AS Problems or Queſtions in Meaſurement, *&c.* are ſolved or anſwered Arithmetically by the Pen, ſo are they alſo inſtrumentally taken by Compaſſes from certain Lines, *&c.* or Rules made for that Purpoſe, for the Help of thoſe that are deficient in Arithmetick, or for a quicker Diſpatch of Buſineſs; and ſuch Performances are called *Inſtrumental Arithmetick*; and of theſe Inſtruments, the in Vogue or Uſe, are theſe Three: 1. The Carpenter's Plain Rule. 2. *Gunter*'s Line. 3. *Coggeſhall*'s Sliding Rule.

1. *The Carpenter's Plain Rule.*

I ſhall deſcribe and ſay ſomething of the *Carpenter's Plain Rule*, in relation to its Uſes, *&c.*

Its Deſcription.

This Rule is made Uſe of in meaſuring Board and Timber, being two Foot in Length, and divided into twenty-four Parts or Inches, and every one of thoſe Parts or Inches ſubdivided into half Inches, and each of thoſe Halves into Quarters, and each Quarter into two Parts; ſo that every Inch is divided into eight Parts, and the whole Length into 192 *Parts.*

This Rule is well known, and therefore not abſolutely neceſſary of Repreſentation, but however, for the better underſtanding it, I ſhall give one, thus:

Under Board Meaſure thus deſcribed.	1	2	3	4	5	6	1 7	
	12	6	4	3	2	2		
	0	0	4	0	4	0		

This Line begins at 6, and goes on to 36, within 4 Inches of the Rule on the Right-hand.

Its Uſe.

	In. deep.	*Feet.*	*In.*	*Pts.*	
A Board be	1	12	0	0	in length make a Foot ſquare.
	2	6	0	0	
	3	4	4	0	
	4	3	0	0	
	5	2	4	5	
	6	2	0	0	

By this Table it is manifeſt, and eaſily underſtood, That a Board of 4 Inches requires 3 Foot in length to make a Foot ſquare, and a Piece of 3 Inches broad will require 4 Foot in length to make a Foot ſquare, *&c.*

At the other End of this Rule is a Table called *Under Timber Meaſure*; and thus deſcribed,

1	2	3	4	5	6	7	8	—
144	36	16	9	5	4	2	2	
0	0	0	0	9	0	11	3	

This Line begins at 8 and half, and goes on (by Diviſions) to 36.

	In. Square.	*Foot.*	
If a Piece of Timber of	1	144, 0	in Length make a ſolid Foot.
	2	36, 0	
	3	16, 0	
	4	9, 0	
	5	5, 9	
	6	4, 0	
	7	2, 11	
	8	2, 3	

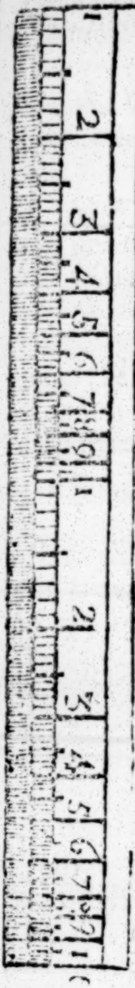
By this Table 'tis plain, That if a Piece of Timber is 6 Inches ſquare, then 4 Foot in Length of that Piece will make a ſolid Foot.

It is a common Method with Carpenters, to add the Breadth and Thickneſs of a Piece of Timber in Inches together, and call the half thereof the Square of that Piece; but this Method gives the Content more than it is; and the greater the Difference, the larger the Error. But the true Square may be found in *Gunter's Line*, thus; place one Point of the Compaſſes upon the Line for the Thickneſs, half way of that Extent, and that will be the true Square in Inches.

2. *Gunter's Line.*

This Line is commonly ſet on the Carpenter's plain Rule and conſiſts of two Lines, one ſet at the end of the other, and Diſtances taken by Compaſſes, as aforeſaid; and it is ſomewhat of the following Form.

Gunter's Line.



To prove the Line by the Compaſſes, obſerve,

1 to 2	equal	2 to 5
5 to 10	Diſtance	4 to 8
4 to 8	to	3 to 6

To Number on the Line.

Obſerve, That the Figures 1, 2, 3, 4, 5, 6, 7, 8, 9, ſometimes ſignify themſelves ſimply or alone; at other times, 10, 20, 30, 40, &c. Again, at other times, 100, 200, 300, or 1000, &c.

To find a Number on the Line, as ſuppoſe 134.

For the Figure 1, account 1 on the Line; and for 3, take 3 of the large Diviſions; and for 4 take 4 of the ſmaller Diviſions; and that is the Point. Again, to find 750 on the Line; For 7 take 7 on the Line, for 50 take 5 of the great Diviſions, and that is the Point.

To find a ſmall Number on the Line; as ſuppoſe 12.

For 1, take 1 as before, and for 2 take 2 of the large Diviſions, and that is the Point.

In meaſuring Board or Timber, it is beſt to have a Line of 2 Foot long, and Compaſſes one Foot long.

Note, *Let the Meaſurement be by the Inch, Foot, Yard, Pole, Rod,* &c. *it is beſt to have it Decimally divided, or ſo ſuppoſed, that is, into* 10 *Parts, as the Meaſurement ſhould require, and on the Carpenter's Rule, the Foot ſo divided.*

Note alſo, *That if the Point of the Compaſſes fall off the Line in the Work, remove it to the ſame Figure or Place on the other Line; and the leſſer Extent you take with the Compaſſes is frequently the beſt.*

Multiplication by the Line.

To multiply 5 by 7, ſet one Foot of the Compaſſes in 1, and extend the other to 5 upwards, and with the ſame Extent place one Foot in 7, and the other Foot will fall on 35 the Anſwer.

Diviſion by the Line.

Example 1. Divide 63 by 3; Extend from 3 to 1 downwards, and the Extent will reach the ſame Way from 63 to 21 the Quotient.

N. B. *In multiplying you muſt always extend upwards, that is from* 1, *to* 2, 3, 4 &c. *and, on the contrary, in dividing extend downwards.*

Example 2. Divide 288 *l.* equally among 16 Men: Extend from 16 to 1 downwards; and that Extent will reach the ſame Way, from 288 *l.* to 18 *l.* for each Man.

Again.

Example 3. Suppoſe 750 *l.* were to be divided among 25 Men; Extend from 25 to 1 downwards; and that Extent will reach the ſame way, from 750 to 30 *l.* each Man's Share.

Rule of Three direct.

Example 1. If a Buſhel of Barley coſt 3 *s.* what will 40 Buſhels? Extend from 1 to 3 upwards, and that Extent will reach the ſame way from 40 to 120 Shillings the Anſwer.

Example 2. If one Ell of Holland coſt 3 *s.* 6 *d.* what will 40 Ells coſt? Extend from 1 to 3 and half upwards; and that Extent the ſame way will reach from 40 to 140 *s.* the Anſwer.

Rule of Three Inverſe.

Example 1. Admit the Buſhel of Wheat to be worth 3 *s.* 4 *d.* or 40 *d.* and then the two-penny Loaf to weigh 20 *oz.* what ſhall the ſaid two-penny Loaf weigh when Wheat is worth 5 *s.* the Buſhel? Extend from 60 to 20 downwards, and that Extent the ſame way will reach from 40 to 13 Ounces and $\frac{1}{2}$ for the Anſwer.

Example 2. If 136 Workmen fortify a Place in a Month or 28 Days, how many muſt be imployed to do it in eight Days? Extend from eight downwards, to 136, and that Extent the ſame way will reach from 28 to 476 Workmen, the Anſwer.

The Uſe in Board Meaſure.

Example. If a Board be 9 Inches Broad, and 19 Foot Long, what is the Content in ſuperficial ſquare Feet? Extend from 12, (the Center of Foot Meaſure) to 9 downwards, and that Extent the ſame Way will reach from 19 to 14 and $\frac{1}{4}$.

In Timber Meaſure.

Example. A Piece of Timber 24 Inches ſquare, and 8 Foot long, what is the Content in ſolid Feet? Extend from 22 the Centre, to 24 Upwards, and that Extent twice the ſame Way will reach from 8 to 32 Foot the Content?

Brick-Work.

How many Rods of Work are there in 4085 Feet? Extended from 272 downwards to 2, and that Extent the ſame way from 4085, will reach to 15 Rods the Anſwer.

3. *Coggeſhal's Sliding-Rule.*

The next Inſtrument I ſhall ſpeak of, is that which goes by the Name of *Coggeſhal's Sliding Rule.* And firſt of

Its Deſcription.

This Rule is framed 3 Ways; ſliding by one another as the Glaſiers Rule; Sliding on one Side of a two Foot Joint-Rule; and one Part ſliding on the other, in a Foot of Length; the back Part being flat, on which are ſundry Lines and Scales.

Upon the aforeſaid Sliding-ſide of the Rule, are four Lines of Numbers, three are double Lines, and one a ſingle Line of Numbers mark'd (as in the Repreſentation by-and-by annexed) with *A B C* and *D*, the three mark'd *A B* and *C*, are called double Lines of Numbers, and Figured, 1, 2, 3, 4, 5, 6, 7, 8, 9. Then 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10, at the End. That marked *D*, is the ſingle Line of Numbers, and Figur'd 4, 5, 6, 7, 8, 9, 10, 20, 30, and at the End 40, even with and under 10, in the double Line next to it, and that is called the Girt-Line, and ſo marked in the Figure.

The Figures on the three double Lines of Numbers, may be increaſed or decreaſed at Pleaſure; thus 1 at the Beginning may be called 10, 100, or 1000; the 2 is 20, 200, or 2000; ſo that when 1 at the Beginning is 10, then 1 in the middle is 100, and 10 at the End is 1000; but if 1 at the beginning is counted for 1, then 1 in the middle is 10, and 10 at the End is 100.

And as the Figures are altered, ſo muſt the Strokes or Diviſions between them be altered in their Value, according

ing to the Number of the Parts they are divided into; as thus, from 1 to 2, it is divided into 10 Parts, and each Tenth is divided into 5 Parts; and from 2 to 3, it is divided into 10 Parts, and each Tenth into 2 Parts, and ſo on from 3 to 5; then from 5 to 6 it is divided into 10 Parts, only; and ſo on unto 1 in the middle of the Rule, or the firſt part of the double Line of Numbers. The ſecond Part or Radius, is divided into the like Radius.

The Girt-line marked *D*, is divided from 4 to 5 into 10 Parts, and each Tenth into 2 Parts, and ſo on from 5 to 10; and then from 10 to 20, it is devided into 10 Parts, and each Tenth into 4 Parts; and ſo on all the Way from 20 to 40 at the End, which is right againſt 10 at the End of the double Line of Numbers.

The Lines on the back ſide of this Rule that ſlides on one ſide, are theſe; *viz.* a Line of the Inch Meaſure from 1 to 12, each divided into Halves, Quarters, and Half Quarters; another Line of Inch Meaſure from 1 to 12, each divided into 12 equal Parts, and a Line of Foot Meaſure, being 1 Foot divided into 100 equal Parts, and figured 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100 even with 12 on Inch Meaſure.

And the Backſide of the ſliding Piece is divided into Inches, Halves, Quarters and half Quarters, and figured from 12 to 24, ſo that it may be ſlid out to 2 Foot, to meaſure the Length of a Tree, or any thing elſe you have Occaſion to meaſure.

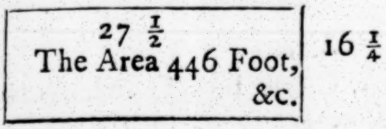
The Uſe of the double Scale.

Example 1.

Suppoſe there is a Geometrical Square, whoſe Sides are 3 Feet $\frac{1}{2}$ each: Set one Foot on the Line *B*, to 3 $\frac{1}{2}$ on the Line *A*; and then againſt 3 $\frac{1}{4}$ on the Line *B*, is 12 Foot $\frac{1}{4}$ on the Line *A*, which is the Content of ſuch a Square.

$$\begin{array}{r} \textit{F.}\ \ \textit{Pts.} \\ \left.\begin{array}{r} 3-6 \\ 3-6 \\ \hline 10-6 \\ 1-9 \end{array}\right\}\text{Arithmetically.} \\ \hline 12-3\ \text{Proof} \end{array}$$

In this Work by Arithmetick I multiply 3 *F.* 6 Parts by 3, and it produces 10 Feet 6 Inches; then I take the half of 3 *F.* 6 for the 6 Inches (by the way of Practice) becauſe 6 Inches is the $\frac{1}{2}$ of 12, *&c.* Again, Suppoſe there is a long Square, whoſe Content is 27 Feet $\frac{1}{2}$ Long, and 16 Foot $\frac{1}{4}$ Wide; what is its Content?



F. Pts.
27,50 Length.
16,25
Anſwer 446,8750 Prod.

Suppoſe the Side of a Rhombus to be 8 Foot 6 Inches $\frac{1}{4}$, and the Breadth, or Line *A B*, 8 *F.* 4 $\frac{1}{2}$, what is the Content? Set 1 Foot on the Line *B*, to 8 Feet $\frac{52}{100}$ on the Line *A*, then againſt 8 Feet $\frac{52}{100}$ on the Line *B*, is 71 Feet $\frac{40}{100}$ Parts of a Foot on the Line *A*. and to know the Value of the Decimal, or Part of the Foot, look for $\frac{40}{100}$ on the Rule, and you will find againſt it 4 Inches $\frac{3}{4}$, ſo that the Content of this Rhombus is 71 Foot, 4 Inches $\frac{1}{4}$.

Again, Suppoſe the Length of a Rhomboides to be 17 *F.* 3, or 17 $\frac{25}{100}$ and the Breadth 8 *F.* 7 or 8 $\frac{58}{100}$ what is the Content? Set 1 Foot on the Line *B*, to 17, 25 on the Line *A*, then againſt 8,58 on the Line *B*, is 148 Feet on the Line *A*. The Figure hath been preſented before, and operated Arithmetically, therefore here unneceſſary.

To meaſure a Triangle by the Rule.

Every Triangle is half of that long Square whoſe Length and Breadth are equal to the Perpendicular and Baſe; therefore from the greateſt Angle or Corner, let fall a perpendicular Line to the oppoſite Side, (as hath been ſaid before) of the Baſe, and to find its Content take half the Length of the Baſe, and the whole Perpendicular, or $\frac{1}{2}$ a Length of the Perpendicular, and the whole Baſe, and then multiply, *&c.*

Example.

Let the Baſe of a Triangle be 4 Foot 1 Inch $\frac{3}{4}$, and the Perpendicular 2 Foot 1 $\frac{3}{4}$: The half of the one, is 2 Foot 7 Parts; and of the other, 1 Foot 7 Parts. Set one on the Line *B*, to 4,15 on the Line *A*; then againſt 1,07 half the Perpendicular on the Line *B*, is 4 Feet and almoſt $\frac{1}{2}$ a Foot for the Content. Or if you ſet 1 on the Line *B*, to

1,07 [illegible] and almoſt $\frac{1}{2}$ a Foot on the Line *A*.

Again, another Way. If you ſet one on the Line *B*, to 4,1 on the Line *A*, then againſt 2,15 on the Line *B* is 8 Foot $\frac{9}{10}$ (which is about 11 Inches) on the Line *A*, the half whereof is 4 Foot 5 Inches $\frac{1}{2}$, which is the Content of the Triangle.

Of the Girt Line.

Suppoſe the Diameter of a Circle be $\frac{25}{100}$ what is its Content? Set 11 on the Girt Line *D*, to 95 on the double Line *C*: then againſt 2 Foot $\frac{25}{100}$ on *C*, the Girt Line is 3 Foot $\frac{98}{100}$ on the double Scale of Numbers *D*, which is the Content.

Board Meaſure.

Suppoſe a Board to be 27 Inches $\frac{1}{2}$ broad, and 15 Foot $\frac{3}{4}$ long, what is its Content? Set 12 on the double Scale *B*, to 27 $\frac{1}{2}$ on the double Scale *A*; then againſt 15 Feet $\frac{1}{4}$ on the double Scale *B*, is 35 Feet, the Content on the double Scale *A*.

When Dimenſions are Feet and Parts, and the Content required in Feet and Parts.

Admit a Board to be 24 $\frac{3}{4}$ Long, and 1 Foot $\frac{1}{2}$ Broad, what is the Content? Set 1 on the double Scale to 1 $\frac{1}{2}$ on the double Scale *A*; then againſt 24 $\frac{3}{4}$ on the double Scale *B*, is 37 Feet $\frac{1}{10}$ on the double Scale *A*, and is the Content.

Suppoſe a Piece of Glaſing be 29 Inches $\frac{1}{2}$ Long, and 7 Inches Broad, what is the Content? Set 144 (repreſented by 1,44) on the Line *B*, to 7 Inches on the Line *A*; then again 29 $\frac{1}{2}$ on the Line *B*, is 1 Foot and almoſt $\frac{1}{2}$ on the Line *A*.

Suppoſe a Room Wainſcotted of 44 Feet in Compaſs and 9 Foot $\frac{3}{4}$ high, what is the Content? Set 1 on the double Scale *B*, to 44 Feet $\frac{1}{2}$ on the double Scale *A*; then againſt 9 Feet $\frac{3}{4}$ on the double Scale *B* is 433 Feet $\frac{9}{10}$ on the double Scale *A*, the Content.

Admit a Piece of Painting 13 Foot $\frac{1}{2}$ Broad, and 23 Foot $\frac{1}{2}$ Long, what is the Content? Set 9 on the double Scale *B*, to 13 $\frac{1}{2}$ on the double Scale *A*, then againſt 23 $\frac{1}{2}$ on the double Scale *B*, is 35 Yards $\frac{1}{4}$ on the double Scale *A*, and is the Content.

Of Bonds, Bills, Indentures, Letters of Attorney, Wills, and other uſeful Writings.

Precedents of theſe are very neceſſary, not only for the underſtanding of them, but to know how to make them authentickly, on emergent Occaſions, *&c.*

A Bond from One to One.

KNOW all Men by theſe Preſents, that I *Abraham Darmell*, of the Pariſh of *St. Sepulchre's*, in the City of *London*, Gentleman, am held and firmly bound to *John Melver*, of the ſaid City of *London*, Eſq; in the penal Sum of Fifty Pounds of good and lawful Money of *Great-Britain*, to be paid to the ſaid *John Melver*, or to his certain Attorney, his Executors, Adminiſtrators, or Aſſigns; for the true Payment whereof, I bind myſelf, my Heirs, Executors, and Adminiſtrators, firmly by theſe Preſents ſealed with my Seal. Dated this twenty-firſt Day of *January*, in the twenty-third Year of the Reign of our Sovereign Lord *George* the Second, by the Grace of God of *Great-Britain, France* and *Ireland*, King, Defender of the Faith, and ſo forth, and in the Year of our Lord, One thouſand ſeven hundred and fifty.

The Coudition of this Obligation is ſuch, That if the above bounden *Abraham Darmell*, his Heirs, Executors, or Adminiſtrators, do well and truly pay, or cauſe to be paid to the above-named *John Melver*, his Executors, Adminiſtrators, or Aſſigns, the full Sum of twenty-five Pounds of good and lawful Money of *Great-Britain*, on the twentieth Day of *Auguſt* next enſuing the Date hereof, with lawful Intereſt: Then this Obligation to be void, or elſe to remain in full Force.

Seal'd and Deliver'd
in the Preſence of
Gregory Needy,
Thomas Truſty.

Abraham Darmell. ○

A Bill with a Penalty.

KNOW all Men by theſe Preſents, That I *John Jenkins* in the City of *Chicheſter*, in the County of *Suſſex*, Victualler, do acknowledge myſelf indebted to *Martin Moneyman*, of *Eaſt Grinſtead* in the County aforeſaid Grafier, in the Sum of twenty Pounds of good and lawful Money of *Great-Britain*, to be paid unto the ſaid *Martin Moneyman*, his Heirs, Executors, Adminiſtrators, or Aſſigns, in or upon the 29th Day of *September* next enſuing the Date hereof, without Fraud or further Delay: For and in Conſideration of which Payment well and truly to be made and done, I bind myſelf, my Heirs, Executors, and Adminiſtrators, in the Penal Sum of forty Pounds, of the like lawful Money, firmly by theſe Preſents: In witneſs whereof, I have hereunto ſet my Hand and Seal this twenty-fifth Day of *June*, in the twenty-third Year of the Reign of our Sovereign Lord King GEORGE II. and in the Year of our Lord God, 1750.

Signed, Sealed, and Delivered, in the Preſence of *John Jenkins.* ○
Titus Teſtimony,
Andrew Affidavit.

A ſhort Bill or Note of One's Hand.

KNOW all Men by theſe Preſents, That I *Peter Pennyleſs*, of the Pariſh of *St. Saviour's Southwark*, in the County of *Surrey*, Blackſmith, do owe, and own my ſelf to ſtand indebted to *Robert Rich*, of the Pariſh of *St. Andrew Holborn*, in the County of *Middleſex*, Gent. in the juſt and due Sum of five Pounds, of lawful Money of *England*, which by theſe Preſents I promiſe to pay unto him the ſaid *Robert Rich*, at or upon the ſixth Day of *October* next enſuing the Date hereof: For the true Performance of which Payment, well and truly to be made, and in Witneſs hereof, I have ſet my Hand to theſe Preſents, this fifth Day of *May*, 1750.

Peter Pennyleſs.

A Penal Bill from Two to One.

KNOW all Men by theſe Preſents, That We *Laurence Luckleſs* and *Peter Pauper*, both of *St. Dunſtan Stepney*, in the County of *Middleſex*, Weavers, do acknowledge and own ourſelves to ſtand indebted to *Gabriel Greedy*, of the Pariſh of *St. Olave, Southwark*, in the County of *Surrey*, Feltmaker, in the juſt and due Sum of ten Pounds, of good and lawful Money of *England*, to be paid unto him the ſaid *Gabriel Greedy*, his Heirs, Executors, Adminiſtrators, or Aſſigns, in or upon the 13th Day of *October* next enſuing the Date hereof, without Fraud or further Delay; and in Conſideration of which Payment well and truly to be made, We whoſe Names are above-written, do bind our

Heirs, Executors, and Adminiſtrators, in the Penal Sum of twenty Pounds of the like lawful Money, firmly by theſe Preſents. In witneſs whereof, we have hereunto ſet our Hands and Seals, this 16th Day of *May*, in the twenty-third Year of the Reign of our Sovereign Lord King GEORGE II. *&c.* and in the Year of our Lord 1750.

Signed, ſealed, and delivered in the Preſence of *Lau. Luckleſs.* ⊙
Peter Pauper. ⊙
Wimbleton Witneſs,
Timothy Teſtis.

Note, *That Bills without Penalty are of no more Force or laſting than Book Debts, as they are not ſealed; yet they are eſteemed better Security, becauſe the Party's Hand, if he contends, is to be proved againſt him: But oft times, on an Adjuſtment of Accounts, it is uſual to have the Party's Hand to the Book, which is as valid as the other; but, in my Opinion, there ought to be a Witneſs to either of them*

Note alſo, *All Obligations muſt now be in* Engliſh, *and may be ſuited to any Condition, by only altering the Name or Names, Place, or Places of Abode, Title or Titles, Sum or Sums of Money, Date,* &c.

An Obligation in Engliſh.

KNOW all Men by theſe Preſents, That I *James Jenks*, of the Pariſh of *St. John Baptiſt*, in the City ot *London*, Haberdaſher, am holden and firmly do ſtand bound unto *Peter Pinch*, of the Pariſh of *Iſlington*, in the County of *Middleſex*, Yeoman, in the Sum of fifteen Pounds of good and lawful Money of *England*, and to be paid unto him, the ſaid *Peter Pinch*, his certain Attorney, his Executors, Adminiſtrators, or Aſſigns, to them or either of them: To the which Payment well and truly to be made, I do hereby bind myſelf, my Heirs, Executors, and Adminiſtrators firmly by theſe Preſents: Sealed with my Seal. Dated the third Day of *Auguſt*, in the twenty-third Year of the Reign of our Sovereign Lord GEORGE II. of *Great-Britain*, *France*, and *Ireland*, King, Defender of the Faith, and in the Year of our Lord God, 1750.

Note, Thus you may proceed of yourſelf, and ſave the Charge of going too far diſtant to a Scrivener or an Attorney, here being no other Charge but the ſtamp'd Paper, and your own Trouble of Writing.

A Letter of Attorney.

KNOW all Men by theſe Preſents, That I *Charles Careful*, of *Lewes*, in the County of *Suſſex*, Apothecary, (for divers Conſiderations and good Cauſes me hereunto moving) have made, ordained, conſtituted, and appointed, and by theſe Preſents do make, ordain, conſtitute, and appoint, my truſty Friend *William Wagſtaff*, of *Pemſey*, in the County aforeſaid, Gent. my true and lawful Attorney, for me, in my Name, and to my Uſe, to aſk, demand, recover, or receive, of and from *A. B.* of *Rye* in the ſaid County, the Sum of forty Pounds; giving, and by theſe Preſents granting to my ſaid Attorney, my ſole and full Power and Authority, to take, purſue, and follow ſuch legal Courſes, for the recovery, receiving, and obtaining of the ſame, as I myſelf might or could do, were I perſonally preſent; and upon the Receipt of the ſame, Acquittances, and other ſufficient Diſcharges, for me, and in my Name, to make, ſign, ſeal, and deliver; as alſo, one more Attorney or Attorneys under him, to ſubſtitute or appoint, and again, at his Pleaſure, to revoke, and further to do, perform, and finiſh for me, and in my Name, all and ſingular Thing or Things, which ſhall or may be neceſſary, touching and concerning the Premiſes, as fully, throughly, and entirely, as I the ſaid *Charles Careful*, in my own Perſon ought or could do, in and about the ſame: Ratifying, Allowing and Confirming, whatſoever my ſaid Attorney ſhall lawfully do, or cauſe to be done, in and about the Execution of the Premiſes, by virtue of theſe Preſents: In Witneſs whereof, I have hereunto ſet my Hand and Seal, the ſixth Day of *May*, in the twenty-third Year of our Sovereign Lord GEORGE II. by the Grace of God, King of *Great-Britain*, &c. and in the Year of our Lord God, 1750.

A Letter of Attorney by a Seaman.

KNOW all Men by theſe Preſents, That I *Timothy Tarpaulin*, Mariner, now belonging to his Majeſty's Ship the *Rye*, for divers good Cauſes and Conſiderations me thereunto moving, have, and by theſe Preſents do make my truſty Friend (or beloved Wife) *Henry Hearty*, Citizen and Baker of *London*, my true and lawful Attorney, for me, and in my Name, and for my Uſe, to aſk, demand, and receive, of and from the Right Honourable the Treaſurer or Pay-maſter of His Majeſty's Navy, and Commiſſioners of

Prize-Money, and whom elſe it may concern, as well all ſuch Wages, and Pay, Bounty-Money, Prize-Money, and all other Sum and Sums of Money whatſoever, as now are, and which hereafter ſhall and may be due, or payable unto me; alſo all ſuch Penſions, Salaries, Smart-Money, or all other Money and Things whatſoever, which now are, or at any Time hereafter ſhall or may be due to me, for my Service, or otherwiſe in any one of His Majeſty's Ship or Ships, Frigates or Veſſels: Giving and hereby granting, unto my ſaid Attorney, full and whole Power, to take, purſue, and follow ſuch legal Ways and Courſes, for the recovery, receiving and obtaining, and diſcharging upon the ſaid Sum or Sums of Money, or any of them, as I myſelf might or could do, were I perſonally preſent; and I do hereby ratify, allow, and confirm, all and whatever my ſaid Attorney ſhall lawſully do, or cauſe to be done, and about the Execution of the Premiſes, by Virtue of theſe Preſents: In witneſs whereof, I have hereunto ſet my Hand and Seal, this 22d Day of *March*, &c.

Timothy Tarpaulin. ⊙

A ſhort Will in Legal Form.

IN the Name of God, *Amen.* The twelfth Day of *April*, 1750. I *William Weakly*, of the City of *London*, Haberdaſher, being very Sick and Weak in Body, but of perfect Mind and Memory, Thanks be given unto God: Therefore calling unto Mind the Mortality of my Body, and knowing that it is appointed for all Men once to die, do make and ordain this my laſt Will and Teſtament; That is to ſay, principally and firſt of all, I give and recommend my Soul into the Hands of Almighty God that gave it, and my Body I recommend to the Earth, to be buried in decent Chriſtian Burial, at the Diſcretion of my Executors; nothing doubting but at the general Reſurrection I ſhall receive the ſame again, by the mighty Power of God. And as touching ſuch Worldly Eſtate wherewith it has pleaſed God to bleſs me in this Life, I give, demiſe, and diſpoſe of the ſame in the following Manner and Form.

Firſt, I give and bequeath to *Elizabeth*, my dearly beloved Wife, the Sum of Five Hundred Pounds, of lawful Money of *England*, to be raiſed and levied out of my Eſtate, together with all my Houſhold Goods, Debts, and moveable Effects.

Alſo, I give to my well-beloved Daughter *Elizabeth Weakly*, whom I likewiſe conſtitute, make, and ordain my ſole Executrix of this my laſt Will and Teſtament, all and ſingular my Lands, Meſſuages, and Tenements, by her freely to be poſſeſſed and enjoyed. And I do hereby utterly diſallow, revoke, and diſannul all and every other former Teſtaments, Wills, Legacies, Bequeſts, and Executors, by me in any ways before-named, willed and bequeathed; ratifying and confirming this, and no other, to be my laſt Will and Teſtament. In witneſs whereof, I have hereunto ſet my Hand and Seal, the Day and Year above-written.

Signed, ſealed, publiſhed, pronounced, and declared, by the ſaid William Weakly, *as his laſt Will and Teſtament, in the Preſence of us the Subſcribers,*

Henry Hardy,
Samuel Short,
William Wortle.

Will. Weakly. ⊙

Note, *If a Will be already made, and the Perſon hath no mind to alter it, but to add ſomething more, there may be affixed the following Codicil or Schedule to it, and it will ſtand good in Law, as Part of the Will.*

A Codicil or Schedule to a Will.

Be it known to all Men by theſe Preſents, That I *William Weakly*, of the City of *London*, Haberdaſher, have made and declared my laſt Will and Teſtament in Writing, bearing Date the twelfth Day of *April*, 1750. I the ſaid *William Weakly*, by this preſent *Codicil*, do ratify and confirm my ſaid laſt Will and Teſtament; and do give and bequeath unto my loving Couſin and Godſon *William Weakly*, junior, the Sum of fifty Pounds of good and lawful Money of *England*, to be paid unto him the ſaid *William Weakly*, by my Executrix, out of my Eſtate: And my Will and Meaning is, That this *Codicil* or *Schedule* be adjudged to be a Part and Parcel of my laſt Will and Teſtament; and that all Things therein mentioned and contained, be faithfully and truly performed, and as fully and amply in every Reſpect, as if the ſame were ſo declared and ſet down in my ſaid laſt Will and Teſtament. Witneſs my Hand this twentieth Day of *April*, 1750.

William Weakly.

A Deed of Gift.

TO all People to whom theſe Preſents ſhall come, I *George Generous* do ſend Greeting. Know ye, That I the ſaid *George Generous*, of the Pariſh of *Pancraſs* in the County of *Meddleſex*, Brick-maker, for and in Conſideration of the Love, Good-will, and Affection which I have and do bear towards my loving Siſter, *Sarah Sorrowful*, of the ſame Pariſh and County, Widow; have given and granted, and by theſe Preſents do freely give and grant unto the ſaid *Sarah Sorrowful*, her Heirs, Executors, or Adminiſtrators, all and ſingular my Goods and Chattels, now being in my preſent Dwelling-houſe in the Pariſh aforeſaid, known by the Name of *Fiſher's Figgary*; of which theſe Preſents I have delivered her the ſaid *Sarah Sorrowful*, an Inventory ſigned with my own Hand, and bearing even Date, to have and to hold all the ſaid Goods and Chattels in the ſaid Premiſes or Dwelling-houſe, to her the ſaid *Sarah Sorrowful*, her Heirs, Executors, or Adminiſtrators, from henceforth, as her and their proper Goods and Chattels abſolutely without any Manner of Condition. In Witneſs whereof, I have hereunto put my Hand and Seal, this 10th Day of *April*, 1750.

Signed, ſealed and delivered *George Generous.* ⊙
in the Preſence of
Daniel Drayton,
Aaron Atkins.

Note, *This Precedent may be extended to the giving away of Cattle, Corn, Houſe, or Land, if not Entailed,* &c. *but the Particulars muſt be named,* &c.

An Indenture for an Apprentice.

THIS Indenture Witneſſeth, That *Richard Reynolds*, Son of *Robert Reynolds*, late of *Pemſey* in the County of *Suſſex*, hath put himſelf, and by theſe Preſents doth voluntarily put himſelf, and of his own free Will and Accord put himſelf Apprentice to *Charles Carpenter*, Citizen and Linnen-draper of *London*, to learn his Art, Trade, or Myſtery, after the Manner of an Apprentice, to ſerve him from the Day of the Date hereof, for and during the full Term of Seven Years next enſuing: During all which Time, he the ſaid Apprentice his ſaid Maſter ſhall faithfully ſerve, his

Secrets keep, his lawful Commands every where gladly obey. He ſhall do no Damage to his ſaid Maſter, nor ſee it to be done by others, without letting or giving Notice thereof to his ſaid Maſter. He ſhall not waſte his ſaid Maſter's Goods, nor lend them unlawfully to others. He ſhall not commit Fornication, nor contract Matrimony within the ſaid Term. At Cards, Dice, or any unlawful Game, he ſhall not play, whereby his ſaid Maſter may be damaged. With his own Goods, or Goods of others, during the ſaid Term, without Licenſe of his ſaid Maſter, he ſhall neither buy nor ſell. He ſhall not abſent himſelf Day nor Night from his ſaid Maſter's Service without his Leave. Nor haunt Alehouſes, Taverns, or Playhouſes: But in all Things behave himſelf as a faithful Apprentice ought to do, during the ſaid Term. And the ſaid Maſter ſhall uſe the utmoſt of his Endeavours to teach, or cauſe to be taught and inſtructed, the ſaid Apprentice in the Trade and Myſtery he now profeſſeth, occupieth, or followeth; and procure and provide for him the ſaid Apprentice, ſufficient Meat, Drink, Apparel, Waſhing and Lodging, fitting for an Apprentice, during the ſaid Term. And for the true Performance of all and every the ſaid Covenants and Agreements either of the ſaid Parties bind themſelves unto the other by theſe Preſents. In witneſs whereof they have interchangeably put their Hands and Seals this 16th Day of *April*, in the 23d Year of the Reign of our Sovereign Lord *George* II. by the Grace of God, King of *Great-Britain*, *&c.* and in the Year of our Lord God 1750.

Note, *If an Apprentice be inrolled, he cannot ſue out his Indenture, but upon Proof of unmerciful Uſage, Want of Victuals, and other Neceſſaries, or his Maſter's being uncapable of teaching him his Trade, or not cauſing it ſo to be done at his proper Charge by others. And the ſame holds good in relation to a Miſtreſs. But there being no Inrollment, an Indenture may be ſued out without ſhewing Cauſe, in Cities and Corporations,* &c.

A General Releaſe.

KNOW all Men by theſe Preſents, That I *Peter Peaceable* of *Haſtings*, in the County of *Suſſex*, Tobacconiſt, have remiſed, releaſed, and for ever quit Claim to *William Winter* of *Rye* in the County aforeſaid, Fiſh Chapman, his Heirs, Executors, and Adminiſtrators, of all and all Manner of Action and Actions, Suits, Bills, Bonds, Writings, Debts, Dues, Duties, Accompts, Sum and Sums of Money, Leaſes, Mortgages, Judgments by Confeſſion, or otherwiſe obtained, Executions, Extents, Quarrels, Controverſies, Treſpaſſes, Damages and Demands whatſoever, which by Law, or Equity, or otherwiſe ſoever, I the ſaid *Peter Peaceable*, againſt the ſaid *William Winter* ever had, and which I, my Heirs, Executors or Adminiſtrators, ſhall or may claim, challenge, or Demand, for or by Reaſon, Means, or Colour of any Matter, Cauſe, or Thing whatſoever, to the Day of the Date of theſe Preſents. In Witneſs whereof I have hereunto ſet my Hand and Seal, this 15th Day of *April*, &c. *Peter Peaceable.* ☉

Some Notes, Rules, Directions, and Monthly Obſervations, concerning Gardening.

JANUARY. *Aquarius,* ♒, *or the Water-bearer.*

THIS Month being generally very cold, and the Earth frozen, there is little to be done in Gardening; but you may prepare a Mixture of Earth and Sheep's Dung to rot and mellow together for a conſiderable time, to layer your Flowers with; and make ready ſuch Ground as you ſhall have occaſion for, by Trenching, *&c.* and dunging that Part that wanteth, and be provided with Horſe, Neat, and Sheep's Dung of two Years old, and with it mingle Loam, and under Paſture fine Mould, and ſtir them together, and then ſkreen it, *&c.* Uncover the Roots of Fruit Trees where there is Occaſion, and tranſplant ſuch as you have a Mind to, and ſet Quickſets; prune and lop Trees, and gather Scions for grafting before the Buds appear.

FEBRUARY. *Piſces* ♓.

In this Month prune Vines and Wall Fruit Trees before the Buds ſwell; but for the Nectarines, and other choice Fruit, you may omit it till the next Month; in nailing the Branches, do not overſtrain them, that hindering the Motion of the Sap; and in a judicial Pruning lies a Maſter-piece of Gardening. If the Froſt hath killed your Cabbage Plants ſet in *September*, ſow Seeds now in a hot Bed, made thus: Dig a Trench according to Diſcretion, about two Foot deep, in the warmeſt Place of your Garden, free from the chilling Blaſts of the North and Weſt Winds; tread it full of Horſe-litter with the Dung, and cover it with rich Earth, half a Foot thick; the Earth muſt be ſkreened or ſifted pretty fine, and cover it with Straw or Mats, in cold Nights only: In ſuch Beds may be ſown the Seeds of Cucumbers, Muſkmelons, or Purſlain. The Grafts of former Years grafting, may be now removed. Sow Peas and ſet Beans about a Foot diſtant. Alſo now, plant the Slips of Gooſeberries and Currants. Moſs your Fruit-Trees, and drain your Orchard and Garden of Wet proceeding from melted Snow or Rain, and ſettled at the Roots of Trees, *&c.*

MARCH. *Aries* ♈, *or the Ram.*

Dung your Orchard, and plant Trees that remain unſet; cover the Roots of Trees that have continued bare ſince *Autumn.* Sow Carrots, Parſnips, Parſley-Seeds, and Turnips for Seed. Set Onions and Leeks, and more Beans and Peas. Now you may take off the Litter from your Aſparagus-Bed, and, after a little digging or ſtirring it, ſift ſome good Earth upon it: But if you make a new Bed, make it as directed in the laſt Month. Set ſhort-ſtalked Cabbage-plants near a Yard aſunder, on the Edges of your Carrot-Ground. This whole Month you may graft, cut off the Tops of your budded Stalks, and prune Grafts of the laſt Year.

APRIL. *Taurus* ♉, *or the Bull.*

In this Month you may ſow Scurvygraſs. Carnations, Radiſhes, Majoram, Thyme, Winter-ſavoury, Purſlain, Marygolds, Hyſſop, and Lettuce: You may likewiſe ſet Slips of Roſemary, Lavender, Thyme, Artichokes, *&c.* Remove your tender Shrubs, and ſlip them after gentle Showers; and alſo ſet French Beans.

MAY. *Gemini* ♊, *or the Twins.*

Begin to graft in this Month, according as you find the Buds ready, which take off the Middle of your Sprouts. Fetch out your Greens, and tranſplant them into Boxes filled with good Earth, mixed with one Part of rotten Cow-Dung, putting Sticks or light Rubbiſh to make the Earth lie light; ſo make a Hole for the Water at the Bottom; then ſet your Plants therein, but not deep: Water them, and ſet them in the Sun.

JUNE. *Cancer* ♋, *or the Crab.*

In this Month, water new planted Trees, and put rotten Fern about their Stems. Inoculate Apples, Pears, Wall-fruit, *&c.* Lop off needleſs Branches from your Vines, and ſtop the Joints. Gather Herbs to keep, in the full of the Moon. You may again ſow Radiſh, Lettuce, and Chervil.

JULY. *Leo* ♌, *or the Lion.*

In this Month, prune Apricots and Peaches, leaving the moſt likely Shoots well placed. Water young planted Trees and Layers. Let Herbs paſt their Seaſon, run to Seed; clip Box that grows irregular, after Rain; ſlip Stocks, Plants and Flowers; lay Myrtles, Jeſſamines, and other Greens. At the End of this Month, ſift your Bed of Off-ſets of Tulips, Anemonies, Ranunculus's, *&c.* Sow Anemony Seeds in fine ſifted rich Earth, either in Beds or Boxes.

AUGUST. *Virgo* ♍, *or the Virgin Sign.*

Prune off ſuperfluous Branches, and Shoots of the ſecond Spring; pluck up Suckers from about the Root; inoculate early, if at all, in this Month. Sow Collyflowers, and Cabbages for Winter Plants; as alſo Corn Sallad, Marygolds, Lettuce, Carrots, Parſnips, Spinage, Onions, Endive, Angelica, Scurvy-graſs, Larks-heel, Columbines, Fox Gloves, Holyocks, and ſuch Plants as endure Winter. Tranſplant ſuch Lettuce as you would have abide all Winter; pull up ripe Onions, Garlick, *&c.* gather ſuch Seeds as are ripe, and clip ſuch Herbs before the Full of the Moon, an Handful high. Sow Purſlain, Chervil, *&c.* Make Summer Cyder and Perry, and gather Seeds of ſuch Shrubs as are thorough ripe.

SEPTEMBER. *Libra* ♎, *or the Ballance.*

Gather your ripe Winter Fruit be ſure in dry Weather. You may yet ſow Lettuce, Radiſh, Spinage, and Winter Herbs. Tranſplant moſt part of Eating and Phyſical Herbs, Artichokes, Aſparagus, Roots, Strawberries, *&c.* As the Weather directs about *Michaelmas*, in fair Weather (but not in a foggy Day) retire your favourite Greens, and choiceſt Plants (being dry) into the Conſervatory. When the Cold comes on, ſet ſuch Plants that will not endure the Houſe, into the Earth two or three Inches below the Surface, and under a Southern Expoſure, covered and cloathed with Hay for their Security againſt the Cold of the Night; but open them in Sun-ſhiny Days, and again in favourable warm Showers.

OCTOBER. *Scorpio* ♏, *or the Scorpion.*

In this Month, it is proper to ſet Fruit-ſtones; ſet them three Inches deep, and the ſharp End uppermoſt, and cover them with Straw: Alſo you may this Month ſow Genoa Lettuce, which with ſmall Care, will be good Sallading all Winter; cover them with Bell Glaſſes in hard Weather.

NOVEMBER. *Sagittary* ♐, *or the Archer.*

Now trench and fit Ground for Artichokes, and plant Trees for Standards and Walls. Alſo lay in your Cellars, Carrots, Turnips, Parſnips, Cabbages and Colliflowers for Seed, to be tranſplanted in the Spring. Now alſo take up Potatoes for Winter's Spending.

DECEMBER. *Capricorn* ♑, *or the Goat.*

In this Month, prune Standard Trees, and Wall-Fruit-Trees, Vines, and Stocks for Grafting; ſet early Peas and Beans, *&c*,

Before this Head of Gardening is concluded, it may be proper to ſay ſomething in relation to Inoculating or Grafting.

Grafting is accounted the niceſt Piece of Art relating to a Gardener; the meaning of the Word Inoculating or Grafting (being now a familiar Word on another Occaſion) is to transform or reform the Fruit of one Tree into that of another, by an artificial tranſpoſing or tranſplanting of a Twig or Scion, a Bud or Leaf taken from the ſame Tree, or of ſome other kind, and placed or put to, or into, that of another, called Grafting in the Cleft.

The beſt Time for gathering Grafts is in the middle of *February*. Obſerve that the Scion is to be cut below the Root.

Grafting in the Cleft.

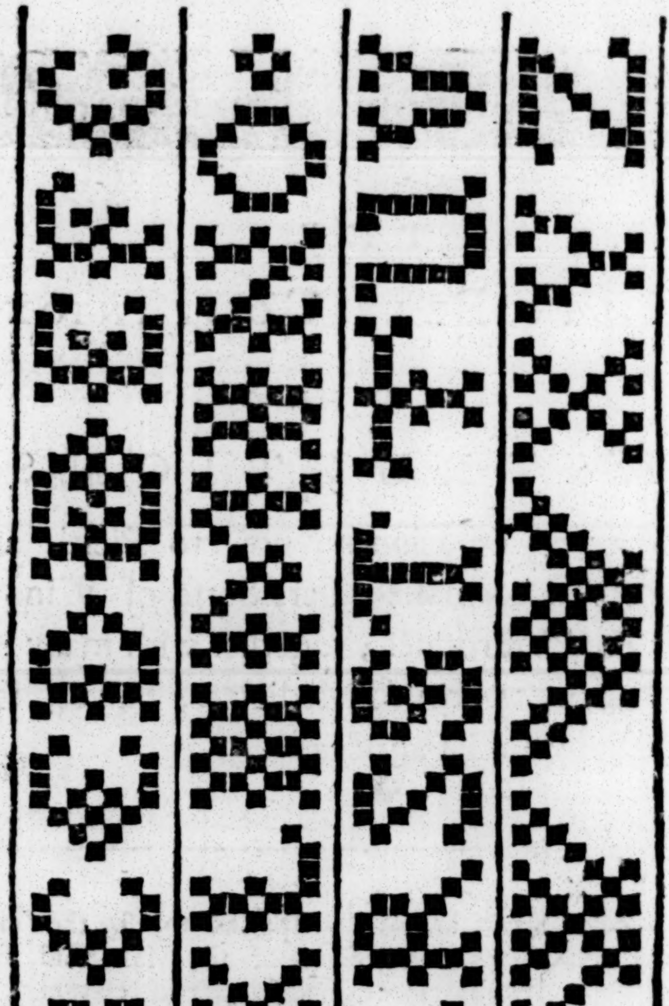
Firſt cut or ſaw off the Top of the Stock to a curious Smoothneſs; then cut two Gaſhes with a ſharp Knife; then with ſmall Wedges, ſharpened according to the Bigneſs of the Graft, being thruſt in, raiſe the Bark of the Stock, and put in the Graft, exactly ſhaped as the Wedge; then cloſe it hard with your Hand, and bind it about with Clay and Horſe-dung mixed. In this manner may any Fruits be grafted, whether Apples, Pears, Plumbs, Cherries, *&c.* The Apple is commonly grafted on Crab-Tree Stocks.

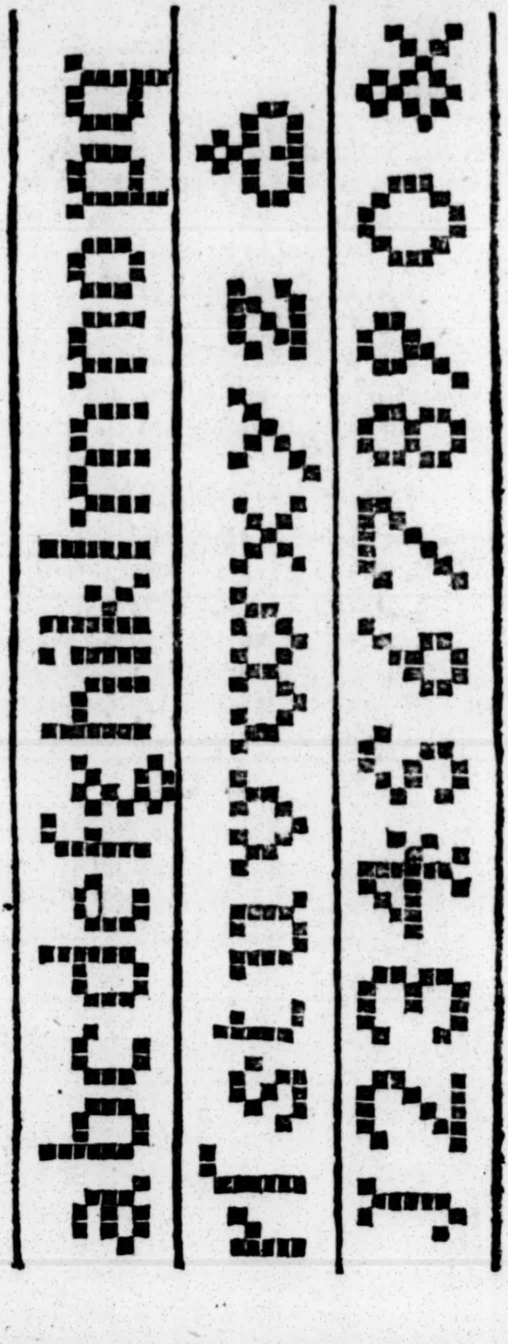
THE
FAMILY'S BEST COMPANION:
GIVING
INSTRUCTIONS
For Marking on Linnen; how to Pickle and Preſerve; to make divers Sorts of Wine of our *Engliſh* Product; together with many excellent and approved Medicines, Salves, *&c.* neceſſary in all Families.

AS many Things have being ſpoken to, for the Information of the younger Sort of the Male-kind, ſo it may not be amiſs to ſay ſome ſmall Matter in relation to the Inſtruction and Benefit of the Female-kind. And firſt,

Of Marking.

This is indiſpenſibly neceſſary and uſeful for the training up the younger Sort of the Female-kind to the Needle, it being introductory to all the various and ſundry Sorts of Needle-work pertaining to that Sex: Therefore I have ſet down the Alphabet in Capitals, or Great Letters, and Small, likewiſe the Figures, that Girls or Young Women, by often Practice, may ſoon attain to Perfection in Marking on Linnen. The Marking Copies are as follow.

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Of Pickling, Preſerving, Candying, &c.

To pickle Cucumbers.

WASH them, and dry them in a Cloth; then take Water, Vinegar, Salt, Fennel-Tops, ſome Dill-Tops, and a little Mace; make it ſharp enough to the Taſte; then boil it a while; then take it off, and let it ſtand till cold; then put in the Cucumbers, and ſtop them down cloſe, and within a Week they will be fit to eat.

To pickle Cucumbers green.

Take two Quarts of Verjuice or Vinegar, and a Gallon of fair Water, a Pint of Bay-ſalt, a handful of green Fennel or Dill; boil it a little, and when cold, put it into a Barrel, and then put the Cucumbers to the Pickle, and you may keep them all the Year.

To pickle French Beans.

Take them before they are ripe, and cut off the Stalks; then take good Wine Vinegar, and boil it with Pepper and Salt; ſeaſon them to your Palate, and let it ſtand till cold; then take the Beans, and put them into a Pot, placing Dill between the Layers, and then put in the Pickle, and cover them cloſe for three Weeks; then take the Pickle, and boil it again, and put it to the Beans boiling hot; cover them cloſe, and, when cold, they will be fit to eat.

Or French Beans may be pickled thus: Take your Beans and ſtring them, boil them tender, then take them off, and let them ſtand 'till cold; then put them into Pickle of Beer; Vinegar, Pepper, Salt, Cloves, Mace, and a little Ginger.

To pickle Eldern, or any other Buds of Trees.

Give them one or two Walms with Vinegar, Salt, whole Pepper, long Mace, and a little Lemon-peel in Pieces; then drain them, and let the Buds and Liquor cool ſeparately; afterwards put them in a Pot, and cover them with your Pickle.

To pickle Wallnuts to eat like Mangoes.

Take green Wallnuts before the Shell is grown to any Hardneſs in them; pick them from the Stalks, and put them into cold Water, and ſet them on a gentle Fire 'till the outward Skin begins to peel off; then with courſe Cloths wipe it off; then put them into a Pot, and put Water and Salt therein, ſhifting it once a Day for 10 Days, 'till the Bitterneſs and Diſcolouring of the Water be gone; then take good Quantity of Muſtard-ſeed, which beat up with Vinegar, till it becomes coarſe Muſtard; then take ſome Cloves of Garlick, ſome Ginger, and a little beaten Cloves and Mace; make a Hole in each Nut, and put in a little of this; then take White-wine Vinegar, and boil them together, which put to the Nuts boiling hot, with ſome Pepper, Ginger, Cloves, and Mace, as alſo ſome of the Muſtard and Garlick, which keep cloſe ſtopped for Uſe.

To pickle Muſhrooms.

Firſt blanch them over the Crowns, and barb them beneath; then put them into a Pan of boiling Water, then take them forth, and let them drain; when they are cold, put them into your Pot or Glaſs, and put to them Cloves, Mace, Ginger, Nutmeg, and whole Pepper; then take White-wine, a little Vinegar, and Salt: So pour the Liquor into the Muſhrooms, and ſtop them cloſe for Uſe.

To pickle any Sort of Flowers for Sallads, as Clove-Gilly Flowers, &c.

Put them into a Gally-pot, with as much Sugar as they weigh; fill them with Wine Vinegar; To a Pint of Vinegar, a Pound of Sugar.

To pickle Samphire, Broom-Buds, Aſhen-Keys, Purſlain, &c.

Take Samphire, and pick the Branches from the dead Leaves; then lay it in a Pot, and make a ſtrong Brine of Water, or Bay-Salt; in the Boiling ſcum it clean; being boiled, and cold, put it to the Samphire; cover it, and keep it for all the Year; and when there is Occaſion to uſe it, take and boil it in fair Water, but the Water muſt boil before you put it in; when it is boiled, and become green, let it cool; then take it out, and put it into a wide-mouth'd Glaſs, and put ſtrong Wine Vinegar to it, and keep it cloſe for Uſe.

To pickle Lemon and Orange Peel.

Boil them in Vinegar and Sugar, and put them into the ſame Pickle: Obſerve to cut them in ſmall long Thongs, the Length of half the Peel of your Lemon: It ought to be boil'd in Water before it is boil'd in Vinegar and Sugar.

To preſerve green Apricots.

Take them when they are ſmall and tender; peel them and put them in hot Water, but let them not boil; let them lie there till they begin to be green, then take them out, and put them in cold Water, then boil your Sugar, and let your Apricots run a little of the Water from them, then put them into the Sugar, and let them boil till the Syrup becomes thick; then put them into an earthen Pan, and let them remain there a Week; then put them into a preſerving Pan, and make them boil again till the Syrup grows thick; then put them once more into an earthen Pan, and let them ſtand till they are cold; then take them out of their Syrup, and lay them on your Ardoiſe: then dry them in your Stove, and turn them often till dry; then put them in Boxes on Paper.

To preſerve Fruit green.

Take Pippins, Apricots, Pears, Plumbs, or Peaches, when they are green; ſcald them in hot Water, and peel them; then put them into another Water, not ſo hot as the firſt; then boil them very tender, and take the Weight of them in Sugar, and put to them as much Water as will make a Syrup to cover them; then boil them ſomewhat leiſurely and take them up; then boil the Syrup till it be ſomewhat thick, and when cold, put them together.

To preſerve Raſberries.

Take good Raſberries that are not too ripe, but very whole; take away the Stalks, and put them into a flat-bottom'd earthen Pan; boil Sugar, and pour it over your Raſberries, then let them ſtand to be cool, and when they are cold, pour them ſoftly into your preſerving Pan, and let them boil till their Syrup be boiled pretty thick; ſcum them very well in the boiling; this done, put them in Pots, and when cold, cover them up cloſe for Uſe.

To preſerve Barberries.

Take one Pound of Barberries pick'd from the Stalks, put them into a Pottle Pot, and ſet it in a Braſs Pot full of hot Water, and when they be ſtewed, ſtrain them, and put to the Barberries one Pound ½ of Sugar, and to them put a Pint of Red Roſe Water, and boil them a little; then take half a Pound of the faireſt Cluſters of Barberries you can get, and dip them in the Syrup while it is boiling; then take the Barberries out, and boil the Syrup till it is thick; and, when cold, put them in Glaſſes with the Syrup.

To preſerve Currants.

Lay a Layer of Currants, and then a Layer of Sugar, and ſo boil them as before preſcribed for Raſberries; ſcum them in boiling till the Syrup is pretty thick; then take them off, and when they are cold, put them in Gally-pots or Glaſſes cloſely ſtopped.

To preſerve Wallnuts green.

Boil the Wallnuts till the Water taſtes bitter, then take them off, and put them in cold Water; peel off the Bark, and weigh as much Sugar as they weigh, and a little more Water than will wet the Sugar; ſet them on the Fire, and when they boil up, take them off, and let them ſtand two Days, and then boil them again once more.

To preſerve Grapes.

Stamp and ſtrain them; let them ſettle a while; before you wet a Pound of Sugar, or Grapes with the Juice, ſtone the Grapes, and ſave the Juice in the ſtoning; take them off, and put them up.

To preſerve Cherries.

Firſt take ſome of the worſt Cherries, and boil them in fair Water, and when the Liquor is well coloured, ſtrain it; then take ſome of the beſt Cherries, with their Weight in beaten Sugar; then lay one Layer of Sugar, and another of Cherries, till all are laid in the preſerving Pan; then pour a little Liquor of the worſt Cherries into it, and boil the Cherries till they are well coloured; then take them up, and boil the Syrup till it will button on the Side of a Plate, and when they are cold, put them up in a Glaſs cloſe covered for Uſe.

To candy Cherries.

Take Cherries before they be full ripe, and take out the Stones; then take clarified Sugar boiled to a Height, and pour it on them.

To candy Pears, Plums, Apricots, &c.

Take them, and give every one a Cut half through; then caſt Sugar on them, and bake them in an Oven, as hot as for Manchet, cloſe ſtopped; let them ſtand half an Hour, then lay them one by one upon Glaſs Plates to dry, and they will appear very fine and clear: In this Manner you may candy any other Fruit.

To candy Flowers.

Pick them very clean, and to every Ounce of Flowers put two Ounces of hard Sugar, and one Ounce of Sugar-candy, and diſſolve them in Roſe-Water; then boil them, till they come to Sugar again, and when it is almoſt cold, put in your Flowers, and ſtir them together, *&c.*

Of the making ſundry Sorts of *Engliſh* Wines.

Currant-Wine.

PICK the Currants (when they are full ripe) clean from the Stalks, then put them into an Earthen Veſſel, and pour on them fair and clean hot Water, that is, a Quart of Water to a Gallon of Currants; then bruiſe or maſh them together, and let them ſtand and ferment; then cover them for twelve Hours, ſtrain them through fine Linnen into a large Earthen Crock, (as they ſay in *Suſſex*) and then put the Liquor into a Caſk, and thereto put a little Ale-Yeſt, and when worked and ſettled, bottle it off: This is exceeding pleaſant, and very wholeſome for cooling the Blood: In a Week's time it will be fit for Bottling.

Artificial Claret.

Take ſix Gallons of Water, two Gallons of the beſt Cyder, and thereto put eight Pounds of the beſt Malaga Raiſins bruiſed; let them ſtand cloſe covered in a warm Place for two Weeks, ſtirring them every two Days well together; then preſs out the Liquor into a Veſſel again, and add to it a Quart of the Juice of Barberies, and a Pint of the Juice of Bramble-berries, or Raſberries, (which perhaps is the beſt) to which put a Pint of the Juice of Black-Cherries; work it up with Muſtard-ſeed covered with Bread Paſte for three or four Days by the Fire-ſide; after which let it ſtand a Week, then bottle it off, and it will become near as good as, if not exceed, common Claret.

Gooſberry Wine.

The beſt way is to take to every three pounds of Fruit, one Pound of Sugar, and a Quart of fair Water; boil the Water very well, but you muſt put the aforeſaid Quantity of Sugar when it is boiled; bruiſe the Fruit, and ſteep it twenty-four Hours in the Water; ſtir it ſometimes, then ſtrain it off, and put the Sugar to it, and let it ſtand in a Runlet cloſe ſtopp'd for a Fortnight; then draw it off, and ſet it up in a cool Cellar, and in two Months it will be fit to drink.

Raſberry-Wine.

Take the Raſberries clear from the Stalks; to a Gallon of which put a Bottle of White-Wine, and let them infuſe in an Earthen Veſſel two or three Days cloſe covered, then bruiſe the Berries in the Wine, and ſtrain thro' fine Linnen gently, then let it ſimmer over a moderate Fire, ſcum off the Froth, and then ſtrain it again, and with a Quarter of a Pound of Loaf Sugar, to a Gallon, let it ſettle; then in half a Pint of White-wine boil about an Oounce of well ſcented Cinnamon, and a little Mace, and put the Wine ſtrained from the Spice into it, and bottle it up.

Damſon-Wine.

Dry the Damſons in an Oven after you have drawn your Bread, then to every Quart of Damſons put three Quarts of fair Water, but firſt boil it very well; then put the Water and Damſons into a Runlet with Sugar; and having ſtood a Time ſufficient, bottle it off.

Wine of Grapes.

When they are fully ripe, in a dry Day, pick off thoſe Grapes that are ripeſt, and ſqueeze them in a Fatt or Preſs made for that Purpoſe, in which muſt be a fine Canvaſs Bag to contain the Grapes; and when in the Preſs, do not ſqueeze them ſo hard as to break the Stones, if you can help it, becauſe the bruiſed Stones will give the Wine a diſagreeable Taſte: Then ſtrain it well, and let it ſettle on the Lees, in ſuch a Caſk or veſſel as you may draw it off without raiſing the Bottom; then ſeaſon a Caſk well with ſome ſcalding Water, and dry it or ſcent it with a Linnen Rag dipped in Brimſtone, by fixing it at the Bouge, by the Bung or Cork; then put the Wine into it, and ſtop it cloſe for 48 Hours; then give it Vent at the Bouge, with a Hole made with a Gimblet; in which put a Peg or Faucet, that may eaſily be moved with the Fingers; then in about two Days Time cloſe it up; and in about two or three Months Time it will be fit for drinking, and prove almoſt as good as French Wine.

Wine of Strawberries or Raſberries.

Maſh the Berries, and put them into a Linnen Bag, as aboveſaid for the Grapes, and ſqueeze them into a Caſk, and then let it work as aforeſaid in the Grape Receipt, *&c.* In this manner may Cherry-Wine be made; but then you muſt break the Stones, contrary to what was ſaid before concerning the Grapes.

A ſhort Way for Cherry-Wine.

Squeeze the Juice of Cherries into a Caſk, and thereto put a ſmall Quantity of Sugar correſponding to the Quantity of Juice; and when ſtood a Month, it will be pleaſant Liquor.

Black-Cherry Wine.

In the ſame Manner, take a Gallon, or more, of the Juice of Black-Cherries, and keep it in a Veſſel cloſe ſtopped till it works; and after it is fine, add an Ounce of Sugar to each Quart, and a Pint of White Wine.

To make Cyder.

Grind, ſtamp, or pound your Apples, and put them into a Preſs, and ſqueeze them through Hair Bags into a Tub; then let it ſettle, and according to your Quantity of Juice, put in ſome Sugar at Diſcretion; then work it up with Ale-Yeſt, and let it ſtand a Week; then prepare your Veſſels according to the Quantity, clean and dry; then put it up; after which, put into a Bag two Pounds of ſtoned Raiſins, two Ounces of whole Ginger, and two Ounces of Iſing-glaſs, and ſee it tied tight with a ſtrong String fixed without-ſide the Barrel, that the Bag may ſink to the Bottom; and after two Months it will be fit for Uſe.

Mead.

Take ſix Gallons of Water, and thereto put ſix Quarts of Honey, ſtirring it till the Honey be thoroughly mixed; then ſet it over the Fire, and, when ready to boil, ſcum it very well; then put to it one Quarter of an Ounce of Mace, and as much Ginger, and half an Ounce of Nutmegs, ſome ſweet Majoram, Thyme, Sweet Briar, together a Handful; then boil them in the Liquid, then let ſtand by till cold, and then barrel it up for Uſe.

Of Jellies.

Let them be of Apples, Currants, Raſberries, *&c.* Take out the clear Liquor (when ſqueezed) and boil it with Sugar 'till it is as thick as a Jelly; then put it up in Glaſſes.

Family Medicines.

Almonds of the Ears fallen down.

Take a little Bole Armoniac in Powder, and with it mix ſome Venice Turpentine, and ſpread it on Sheeps Leather as broad as a Stay, and apply it under the Throat, from Ear to Ear.

Ague.

Drink the Decoction (that is, the boiling off of any Herb) of Camomile, and ſweeten it with Treacle; which drink when warm in Bed, and ſweat two Hours. Or to the Wriſts apply a Mixture of Rue, Muſtard, and Chimney-ſoot, by way of Plaiſter.

Aſthma,

Aſthma, or Shortneſs of Breath.

Take a Quart of Aqua Vitæ, one Ounce of Anniſeed bruiſed, one Ounce of Liquorice ſliced, half a Pound of ſtoned Raiſins, and let them ſteep 10 Days in the abovementioned; then pour it off into a Bottle, with two Spoonfuls of fine Sugar, and ſtop it very cloſe.

St. Anthony's Fire.

Take a Purge; and anoint the Place with the Marrow of Mutton.

Bruiſe or Scald Outward.

Take a Quart of Neats-foot Oil, half a Pound of Red Lead, two Ounces of Bees-wax; boil them together three Hours, and ſtir them well.—Or, Oil of Eldern bathed, or rubb'd on the Place, will have the ſame Effect.

Bruiſes Inward.

Drink the Decoction of Comfrey with Bread and Butter.

Bound in the Body.

Take Cream of Tartar, mixed with Honey, very frequently.

Piles or Sores.

Eat Roſemary and Sage with Bread and Butter, and apply Wheat-Flour and Honey by way of Plaiſter.

Bloody Flux.

Take as much Linnen-Cloth as will make a Suppoſitory; being wrapp'd round Button-wiſe; wet it in the beſt Aqua Vitæ, or Aqua compoſita; which, properly applied, will help them in two or three Applications. This is an approved and ſure Medicine.

Bleeding at the Noſe.

Put into your Noſtrils Coney-wool rolled in Bole Armoniac.

Blood purged.

Drink often of the Tea of Ground Ivy, or of Saſſafras Chips.

Canker in the Mouth.

Take the Juice of Plantain and Roſe-Water mixed, and with it frequently waſh your Mouth.

For a Cough.

When you are going to Bed, drink Brandy, Treacle, and Sallad Oil, mixed: Or, Take a Mixture of Butter and brown Sugar.

Convulſions in Children.

Take unſlacked Lime one Quart, and to it put five Quarts of Spring-water; let it ſtand 24 Hours, in which Time ſtir it three times, ſcum it, and take the clear Water, and let it ſtand 12 Hours more, and ſtrain it through a Cloth; and being put into an Earthen-pot, put to it Aniſeeds and Fennel Seeds, of each a Quarter of a Pound; Liquorice bruiſed, and Saſſafras, of each an handful: Let them ſtand four or five Days, and then let the Child drink a Quarter of a Pint, Morning and Evening, as long as it laſteth.

Conſumption.

Take as much new Milk as a common Still will hold, to which put the Herbs following, *viz.* Hyſſop, Cowſlip Leaves, Horehound, and Colts foot, of each a handful; and of Maiden-hair one Ounce; let them ſtand all Night, then ſtill them off; and when it is to be drank, ſweeten it with Syrup of Cowſlips, or good Sugar.

Cholick.

Beat the Hips of wild Roſes (gathered in Winter) into Powder, and half as much ſliced Nutmeg; mix them, and take ſome in all your Drink: This is an excellent Remedy.

To cure Drought in an Ague.

Take a ſmall Quantity of Burridge, Sorrel, Violet Leaves, and Strawberry Leaves; ſeethe them in two Quarts of fair running Water 'till it conſume to one Quart; then take Almonds and blanch them, and when beaten, put them to the ſaid Water, and to it put a little Sugar, and drink it warm.

Dropſy.

Take Broom-Aſhes, and Muſtard-ſeed ſteeped in a Pint of White-wine: of which drink often. *Approved.*

For a Sore Throat.

Take Columbines and Cinquefoil, ſtamp them, and ſtrain them into Milk, and drink it very warm.

For the Gripes.

Take a ſliced Nutmeg in a Quartern of Brandy warmed over the Fire; to which put the Beaten Yolk of an Egg, with a little Water and Sugar; ſtir them together over the Fire to thicken a little: Take it at Night going to Bed.

For the Stone, or Stoppage of Urine.

Take a Quantity of Thyme, Parſley, Tops of Fennel, and Cinquefoil a little Quantity, five or ſix Cloves of Garlick; ſtamp them all together, and ſtrain them into White-wine or Ale, and drink of it Morning and Evening.

To cauſe an Appetite.

Seethe Centaury in fair Water, and drink it in a Morning faſting, to the Quantity of nine Spoonfuls, lukewarm, for three Days.

An eaſy and ſafe Purge.

Take Cream of Tartar one Ounce; Jalop and Brimſtone of each a Quarter of an Ounce: The Jalop muſt firſt be beaten into fine powder; and mix them thoroughly together in a Mortar; but if the Perſon be hard to work on, put two Drams of Jalop more.

Small-Pox.

When warm in Bed, drink mulled Ale with Marygold-Flowers, and ſweat a little, to bring them thoroughly out; and to keep them from ſinking, take Brimſtone and Treacle.

For the Itch.

Take Frankincenſe and beat it ſmall, and mingle it with Oil of Bays, and therewith anoint all over.

For a Burn or Scald.

Take Oil of Eldern, and anoint the Place: This is a ſure Remedy.

Againſt a Fever.

Take a Handful of Bay Leaves, and a large Handful of red Sage; ſeethe them in two Quarts of Ale, 'till they come to one, and let the Patient (being in Bed) drink thereof a good Draught warmed, with a little Sugar..

To make an approved Ointment for old Aches, &c.

Stamp Smallage, and add to it ſome Aqua vitæ, and Boar's Greaſe; ſtir them well together, and anoint the Place before the Fire, Evening and Morning.

To make Melilot, excellent for Plaiſters.

Take Melilot, Pimpernel, and Scabious, of each two Handfuls; cut them ſmall, then beat them in a Mortar with two Pounds of Hog's Lard; let it ſtand in the Sunſhine ſeven or eight Days, (it being uſually made in *June*) then melt and ſtrain it well; then add as many more freſh Herbs, and ſet it in the Sun as before, and then melt and ſtrain it again; then boil it 'till the Juice is conſumed; then take it off the Fire, and put to it beaten Reſin, Bees-wax, and *Venice* Turpentine, of each one Ounce; when cold, put it up in Pots, or make it up in Rolls.

THE GENTLEMAN and FARMER'S NEW GUIDE: WITH Good *Advice* to a GROOM.

THE firſt Part of this Treatiſe is to ſhew you ſomething of the Rule of Management, which is from the Day of Foaling to his latter End. What a Pity is it, that ſuch a fine Creature as a Horſe is (in his Kind) in whatſoever Buſineſs you put him to, both at Home and Abroad, ſhould be abuſed! and what bad Uſage there is at this Time committed, for want of a right Management, and good Uſage of ſome Horſes that are now bred! For when he is well bred, and has not good Care taken of him, he will ſoon be in the Condition that a great many are.

Having given you a brief Account of the Care you muſt take to preſerve the Beauty of this noble Beaſt; and what Pleaſure it is for any Lord and Maſter to ſee them in good Health and Proſperity, the Choice of your Breeders is the firſt Article; then all the reſt lies in a right Management, let your Horſes be what Size they will; the Size that you deſire your Horſes to be, that Size you muſt make Choice on for your Breeders; and afterwards the Care lies in the Maſters and Servants that ride and feed them. Thoſe Men that love good Horſes, muſt always be careful in Riding, and the Groom be very neat in his Stable, and to dreſs him very well, and keep him very warm, ſtuff his Feet, and greaſe his Heels with any freſh Greaſe; and when he is hot, don't waſh him, but rub him well down; give him his Feed in due Time, and always obſerve, that his Shoes be faſt when he goes out of the Stable, and always keep your Saddles and Bridles in a Readineſs: Buy good Hay and Corn, and good Litter, and this is the Buſineſs of a Groom. And he muſt be of good Temper, and not haſty; if the Horſe commits a Fault, not to beat him with unlawful Weapons, for fear of any Accident, but give him mild Correction 'till he is ſenſible he has committed a Fault; and when he is broke of it, you muſt make much of him, and encourage him in his well doing. The Rider muſt always be upon his Guard; you muſt obſerve to take the beſt Road you can, and all Advantages in any hard Labour that you put him to, and not to ſtrain, or beat him out of his Wind; keep him with a ſtreight Rein, for that keeps his Wind, and ſupports his Spirits, ſo that he will go through his Work with Chearfulneſs.

So that every Gentleman or Farmer that would have good Horſes, and preſerve their Health, (which I believe all Men are willing to do) muſt be careful to obſerve all the Points belonging to a Horſe, as to his Feeding, not to fling him a Feed of Corn, or a Bit of Hay; that will not do, but, he muſt have good Dreſſing, proper Seaſon for his Feed and Exerciſes, which is left to the Care of the Groom, who is not to ride him beyond his Strength. When he goes out of the Stable give him Time to empty his Body, and do not whip or ſpur him, but mildly ride him.

Keep a good Guard before your Eyes in Riding or Jumping, ſo by your Care you may preſerve your Horſe, and gain yourſelf Reputation from thoſe you ſerve. And when you come to read over this Treatiſe, I don't queſtion but you will find great Satisfaction concerning this noble Creature.

RULE *the* FIRST.

Firſt, You are to take Notice, that I ſhall ſhew you how you ſhall chuſe your Horſes and Mares, and how they ought to be managed in Breeding, &c. There are ſome People of that Opinion, that there is great Difference as to the Colour of a Horſe; but it is my Opinion, there can be little or no Difference in that, for there are good Horſes of all Colours, as well as bad: But the beſt Colours for Beauty are a Coal Black, a bright Bay, or a good Grey, or a Dun is very well; any of theſe Colours before mentioned are very agreeable, and moſt likely to prove good Horſes; on the contrary, Horſes that are bald-faced, wall-eyed, or white Feet, or any Mixture of Colours, are not ſo well. Let him be of a true Shape and Make ; if he has a little White on his Feet, or what you call a Star, or a Snip on his Noſe, it is an Ornament to a Horſe. Thoſe Horſes that are of a mix'd Breed are apt to be given to Humours, Running at the Heels or Eyes, and ſome will be of a malicious Temper ; but ſee that he be of a good Breed both from Horſe and Mare, and then you need not doubt but he will anſwer your Expectation, if it pleaſe God no Misfortunes happen to him.

The next Thing I ſhall treat on, is the Manner of Breeding, to know the true Size of your Horſe and Mare, let them be for Coaching or Hunting. Let your Horſe be fifteen Hands high, and the Mare fourteen Hands and a half, for it is proper the Horſe ſhould have the Advantage of the Mare, for when the Mare is higher than the Horſe, there may happen a great many Accidents to the Horſe, by overſtraining himſelf in being too fond of the Mare.

Now I have given you an Account of their Height, I ſhall proceed to give you ſome Account as to their Age, which ought to be about five or ſix Years old when they come together.

The next Thing I ſhall preſcribe, is to give you ſome Directions how to know the Shape of a Horſe, and how he ought to be made. Let your Horſe be of a true Shape in all Parts of his Body, let his Head be ſmall, and his Ears the ſame, and ſtand upright, his Neck ſhort and thick ; with a large Mane, well breaſted, with a round Body, ribb'd up to his Buttock, with a middle ſiz'd Dock, and be ſure that his Stones be both come down, and both of a Size, not broken belly'd, well ſpread behind, his Legs flat and well-jointed, ſhort Paſterns, with his Feet broad at the Heels, his Hoof as black as a Cherry, and his Eyes ſtanding full in his Head, with a briſk Look, and brown as a Berry. And by chuſing your Horſes, the ſame Rule is to be obſerved in chuſing your Mares ; be ſure let them be both of a Colour, with their Marks both alike, then you will not miſs of your Breed ; for when you have them according to your Deſire, in right Shape and Colour, and perfectly ſound in all Parts, you cannot fail of a good Breed.

But there are a great many Men that have lame Horſes or Mares, or blind ones, who will ſay, I will turn them to Graſs, they will ſerve to breed on, which is a very wrong Notion, and very often infects the Foal ; ſo that the ſame Diſtempers which the Horſe or Mare has, will certainly attend the Foal.

Now by this great Miſtake Men run into Errors, and take little or no Care to preſerve thoſe which are ſound and fit for Breeders, which if they be not bred ſound, 'tis a Thing impoſſible to make them ſound afterwards. Courteous Reader, I have endeavoured to give you a full Account of the Manner of chooſing your Breeders in all the Points relating thereto, I ſhall therefore proceed to give you ſome uſeful Obſervations concerning the ordering your Foals, 'till they be of Age, and fit for proper Service.

RULE *the* SECOND.

As ſoon as your Mares come to foal, keep them aſunder; for when there are two Mares together, and both have Foals by their Sides, as 'tis very well known that a Mare is mighty fond of her Foal, ſo for that Reaſon they ought not to be together; for if one Foal goes to the contrary Dam, and ſhe finds it not her own, the Mare will ſpitefully bite and kick it, and by that means the Foal may be ſpoiled; for when they are ſo young and tender, the leaſt Kick that is may make Cripples of them as long as they live, and the Care you have taken before is all loſt; ſo I adviſe you to keep them aſunder 'till they be a Year old, which is the proper Age to wean them, and not before, becauſe their Mouths are ſo tender, that it ſtrains their Eyes to eat hard Meat, and is apt to bring Humours into their Heads, but when they are a Year old, (as I ſaid before) they may eat Oats or Bran, and good ſhort Hay, and you may venture to put three or four of them together, but let them be all Foals; put none of two Years old with them, for when they be all of one Age, they will be the better able to bear the Blows they may give one another; ſo that there is no great Danger by putting them together; and put them in dry Grounds, and give them the beſt of Hay you can get in the Winter, and all Oats, no Beans nor Peaſe, becauſe they are ſo hard that it ſtrains a Foal to eat them.

But when they are about four or five Years old they may eat them; and he that looks after theſe Foals muſt take care he do not learn them any bad Tricks, as to bite him, or kick him, but ſtroak them with his Hands, and not to play with them, nor point with his Fingers at them;

for when they have learned any Tricks in their Coltage, 'tis a hard Matter to break them.

When they come to be fit for future Service, and the Man that looks after them uſes them well, and does not learn them any bad Tricks, then they will be mighty fond of him, ſo there will be a great deal leſs Trouble when they come to be broke; and at four or five Years of Age a Colt will be fit to come under the Care of a Rider or Groom, to be made fit for his Maſter's Service.

Having now done with the *Second Rule*, I ſhall proceed to the *Third*, wherein I ſhall lay down ſome uſeful Obſervations relating to the Duty of the Rider, and how to know when a Horſe is fit for his Maſter to ride.

RULE *the* THIRD.

When your Horſe comes to be four or five Years of Age, which is a proper Time for bringing him to the Buſineſs you deſign him for,

The firſt Thing that you have to do, is to bring him into the Stable for two or three Days, and acquaint him with another Horſe, and tie him up with a Halter; and the Rider or Groom muſt make much of him, and after that put on him a Bridle, and let him ſtand two or three Days with the Bit in his Mouth, and that will bring him to bear on his Bit, that you may the better rule him when you come to back him.

The next Thing you are to obſerve is, you muſt lead him about in your Hand, and lay a Saddle on his Back; or you may let a Boy of ſmall Weight ride him for a Week or more; but be ſure take care that he don't throw him down, for that will give him great Encouragement to commit other bad Faults, and it will be a great deal more Trouble to bring him to his Paces, for he will be always thinking of one Thing or another that he may quit you from his Back, which if he once gets any of thoſe evil Habits, you will find it a hard Matter to break him, for a Horſe is very ſubtle, and he will be taking all Opportunities that ever he can.

I adviſe you to keep a good Guard, and let him not get the upper hand of you; for if he finds he gets the Maſtery of you, you will find it a hard Matter to break him, as I ſaid before.

Be ſure you keep yourſelf ſober when you are to ride; keep good Bridles, and good Girths and Stirrups for your

Buſineſs; but I need ſay but little as to the Rider's Buſineſs, becauſe every Man that follows that Buſineſs ought not to have his Buſineſs to learn when he has his Work to do.

So I ſhall juſt mention two or three Things more. You muſt learn him to walk on boldly, not ſtopping at a Dog, or a Poſt, or any Thing of that kind; for when he does, you muſt give him good Correction, and you muſt walk him back again, and let him know his Fault; then if he goes on well, and is made ſenſible that he has committed a Fault, make much of him, and you will quickly find that he will be mightily encouraged in his Buſineſs, and when he comes to walk well, he will take Pleaſure in it, and take his Paces with a great deal of Delight.

When he comes to have a good Mouth, and walk well, and is not frighten'd at little Things that he ſees, then you may trot and gallop him, and be ſure you well inſtruct him in all Points, with a right Management in all his Paces, and when you have brought him to all his Paces according to his Maſter's Deſire, then if he comes to ride him, and finds his Temper, and that he carries him well, then the Rider gives him Satisfaction ſo far.

Now I hope the Maſter of the Horſe will be encouraged with his Horſe, both for his Profit and for Pleaſure, and with as little Trouble as may be, and at as ſmall an Expence of breeding a good Horſe as a bad one, with a little more Care of keeping them from Accidents, and chuſing your Breeders.

So if a Man has got a good Horſe, let him be for Running or Hunting, or any other Buſineſs, and that Man has a mind to part with him, he may have any Money ſor him when his Goodneſs is once known, becauſe they are ſo hard to be got; for a Horſe is ſo fine a Creature in his kind, that every Man that gets a good Horſe which is perfectly ſound Wind and Limb, he thinks him not too dear, let him coſt what he will.

By obſerving theſe Rules with Care, you may as well have a good Horſe as a bad one, for there are the ſame Accidents in bad Breeders as there are in good ones.

RULE *the* FOURTH.

The fourth Thing you are to take Notice of, is the Office of a Groom, and that his Maſter may know the Benefit of his Servant.

Firſt, The Office of a Groom is, to know how to look after his Horſes, and how to dreſs and feed them, and give them their Exerciſe.

The firſt Thing you do in a Morning, give your Horſe a Feed of Corn, then clean your Stable very clean, then dreſs your Horſe, and a Quarter of an Hour after he has eat his Meat, give him Water, and then give him Exerciſe in a moderate Way till he begins to ſweat, then you muſt rub him well down, and you may pull down his Litter, and put a little Hay in his Rack, then leave him for an Hour or two, and then rub him with a Bruſh; thus his Coat will ſhine, and he will be as ſleek as a Mole, if he be in good Health; for a Horſe ſhews his Illneſs by his Coat's ſtaring, the ſooneſt of any Rule you can go by; for if he catches Cold, you may ſoon know it by the ſtaring of the Hair, which may be ſeen before it turns to a Cough.

And if you ride him into the Water, when he is hot, it is a bad thing, or let him ſtand wet with his Sweat on him, or in a bad Stable when you are abroad on a Journey, and a great many more little Accidents that may happen, which are too tedious to mention, and which any Man that is a Groom cannot but know; for a Man that has good Horſes to look after, who is a profeſs'd Groom, cannot but take a great deal of Pleaſure to ſee them in good Order, as his Maſter does who is the Owner of them.

And ſo the Office of a Groom is to take care that his Horſes are kept from taking Colds as much as poſſible, and not to ride them at a great rate, nor yet to beat them with unlawful Weapons when they commit a Fault; and in a Horſe's well-doing you muſt encourage him, by ſhaking the Bridle, or ſtroke him with your Hand, or give him ſome pleaſant thing to eat; ſo, by degrees, the Horſe will be as fond of you, as you are of him.

And the Maſter of that Servant will, no doubt, take great Delight to ſee his Horſes ſo well managed, and in good Health.

Now if theſe Rules ſhall give the induſtrious Groom any Knowledge in this Art, I ſhall not think my Labour loſt; and by theſe Rules, which are laid down in ſuch a familiar way, that any one who has but little Knowledge in his Buſineſs may ſoon be a Maſter of it; and if the Maſter has any Judgment in Horſes, he may ſoon find out when he has a Servant that knows his Buſineſs; and then if he be, you have great Encouragement in what you have taken in hand.

A Horſe that is ſound, and ſo well bred, which by the foregoing Rules is ſet before you, you cannot fail of having good Horſes, and I hope you will find the Benefit of it; when you come to ſell a Horſe for 20 or 30 Pounds, in four or five Years, it will requite you for your Trouble; there is no doubt of it, for a Horſe of that Price is as ſoon ſold as one of five Pounds; ſo when you have taken it into Conſideration, you will find it as much Profit as Pleaſure, and then you will find what great Miſtakes have been made for ſome Years paſt in breeding of Horſes for want of Care; which now, at this time, if a Man has got a good Horſe that is right ſound, and of a right Shape, if he has a mind to part with him, he may have any Money that he will aſk in Reaſon for him. What a Pity is it that ſuch a noble Creature as this is, ſhould be ſo miſuſed for want of a right Management?

How many Writers are there who have taken great Pains in ſhewing you the Errors and Misfortunes of the Neglect in thoſe who pretend to be Breeders of them.

Now I have given you a few plain Rules to go by, as ſhortly as I can, and when you come to make a Trial of them, you will find them to anſwer your End in whatſoever Buſineſs you deſign your Horſe for.

RULE *the* FIFTH.

The *Fifth* Rule begins with ſome few Directions for buying your Horſes, and how to know if they be ſound. A Man ought to be of good Judgement, and very watchful concerning the Points of a Horſe, for there are many of the Dealers, and others, who have bad Horſes to ſell, will have a great many Tricks to put them off if they can. So the firſt Thing you are to obſerve is his Eyes, to ſee if they be well fixed in his Head, with a good briſk Look; a full and brown Eye is reckon'd the beſt, but if he has a little blue Eye, looks weak, and flags his Ears, that is a great Sign he'll go blind.

If he is very thick under his Jaw, and very narrow, that is another bad Sign; but if he has a thin Head, his Eyes ſtanding full in his Head, this is a good Sign that he never will be blind. Then you may look round him, and ſee the Make of his Body, obſerving that he has a good Shape, and is well ribb'd; and be ſure you obſerve all Parts of his Legs, that he has not got Spavins, or Sinew Strains, or Splints or Greaſe-heels, or Ring-bones, or Foundered, or any other Accidents that may happen of this Kind, or the Pole-evil or Fiſtula; and after you have looked round him, you may examine into all thoſe Diſtempers that belong to a Horſe, and you muſt feel with your Hand upon his Head, if he has had any Accidents there, and ſo ſtroke him to the bottom of his Feet; and if you cannot find any thing amiſs in him that way, you may ride him eaſily, and ſee how he goes, if he walks well, or if he be lame; if you find him ſound, then trot him and gallop him till he begins to ſweat, and that will give you a great Inſight how his Wind is, for that is a great Article which belongs to a Horſe, there being no greater Cheat than that among Horſes.

There be ſome Men that will ſtop the Glanders for two or three Days, but when you come to ſtrain him, you may ſoon find it out, for he will fetch his Breath very ſhort, and heave if he has any Misfortune in his Wind; he will throw his Head about, and blow his Noſtrils if he has the Glanders. Then you muſt feel under his Throat to find if he has any Kernels, and if he has, you may reaſonably believe he is not in a good State of Health, for he is glandered, or elſe he has got the Quinſey; be ſure to ſmell up his Noſe, for if he has any of theſe Diſtempers, his Breath will inform you of his Diſtemper; for a Man that is a Dealer in Horſes, and is employed to buy for any Gentleman, had need to have his Wits about him, if he would keep up his Character; for many a Man that takes all the Care he can, may be cheated, and then the Maſter he buys the Horſe for, thinks he knew of it, and ſkreen'd it with a Deſign to cheat him; oftentimes a Man is cheated, and don't find it out for two or three Days. There are ſo many Tricks found out in the Way of Cheating, that it is a thing impoſſible for one Man to find them all out; a good Horſe being ſo ſcarce to be found, that makes ſo many Tricks be play'd; if a Man buys a Horſe, and he proves not to be ſound, he would willingly put him off again if he can. Now for want of right underſtanding, and good Horſes, makes the Art of Cheating be ſo much in Faſhion; for a Horſe that is right ſound, and of a good Make, will be ſold at any Price.

So every Farmer who has Conveniency for breaking his Horſes, will find good Profit in breeding good Horſes, and leſs Trouble, than he will with thoſe that are infirm; for in four or five Years Time they will be fit for Buſineſs, let them be for what they will. And if you breed more than what you have occaſion for in your own Buſineſs, you may have a good Horſe to ſell, which will be any body's Money.

But now many Men who breed Horſes, make no Choice of their Breeders, for let them be lame or blind, they will ſerve to breed on, which is a very wrong Notion; ſo there is many a Man, who has but little Experience in Horſes, thinks that a lame Horſe and a lame Mare, or a blind one, may bring as good a Foal as the beſt; and this great Miſtake is the Occaſion of ſo many bad Horſes, for the bad Humours that attend the Horſe or Mare, very often attend the Foal; and when that comes to grow up, and is put to Buſineſs, the Humours flow about him, and put out his Eyes, or fall into his Legs or his Feet, and ſometimes turn to the Pole-evil or Fiſtula; for it is moſt certain, where Humours abound, they muſt in courſe have a Vent ſomewhere, and then it is ten to one, whether ever he be made ſound or no as long as he lives.

So by this Misfortune it puts Men upon their Tricks, reſolving to cheat ſomebody or other, if it is poſſible; then that Perſon that buys him, when he finds he is cheated, he next way ſets a Farrier to work, and puts himſelf to a great Expence, but to no Purpoſe, for he never can be made ſound; therefore I wiſh that thoſe who have been, and are Breeders, would but take the Pains for one ten Years, to follow theſe plain Directions, I doubt not but you will find great Amendment in your Breeders; and I hope, when you come to make Trial of theſe few Rules that you have before you, they will inſtruct you farther in the Affair of ſo noble a Creature as a Horſe is, when he is ſo well bred as he ought to be. I have only put down theſe few Directions, which, I think, may be of Service to any Farmer, that has a mind to have a good Horſe to himſelf.

RULE *the* SIXTH.

Now the *Sixth* Thing is, to give ſome Inſight into the great Miſtakes that are made by Farriers who are not Maſters of their Buſineſs, and the great Satisfaction of thoſe who are Maſters of that Art, doing Juſtice to you and himſelf.

There are a great many Men, both in Town and Country, who are Smiths only, and yet they all pretend to be Maſters of that Art; they will tell you they have a great deal of Practice, but when a Man comes to try him, perhaps he knows little or nothing of the Matter; that is to ſay, they can be no true Judges in this excellent Science. Perhaps they may know two, or three, or four Drenches, and three or four Purges, which may be very good if they were applied properly by an experienced Farrier; I ſay, it is not the giving him theſe Drenches, right or wrong, hab nab at a Venture, that will anſwer the End, but a Man muſt look well into the Horſe, and be ſure he find out the right Ailment before he can preſcribe any proper Medicine for him to effect the Cure.

Now there are a great many Men, who will juſt look at a Horſe, and no more, and yet they will ſay, I will give him a Drench that will cure him; then the Owner of the Horſe ſays, take what Care you can of him; ſo the Farrier goes to work with him, right or wrong, Luck's all; if it happens to do well, that is, if the Horſe does well, then that Man is cry'd up for an eminent Farrier; but it is my Opinion, no Man can give a right Sentiment where a Horſe's Ailment is at firſt Sight, it's a Thing impoſſible; they ought to ſee how he is in his Body, whether he be bound or looſe, or if he can ſtale, and if he can do both; a Man cannot tell by juſt looking on him, he may have a Pain in his Bowels, or a Griping in his Belly, or he may have a Pain at his Breaſt; ſo by the Horſe's Motion of his Head, and ſtamping with his Feet, gives the Rules you muſt go by to find out his Diſtemper, for 'tis a Thing impoſſible for a Man to know, that don't ſtay two Minutes with him; and the Drenches he gives him may as well kill him as cure him, it has the ſame Chance; now this is the Miſtake that is made by Farriers.

For if any Man is a Judge of the Signs of Horſes Motions, and the Rules they make for you to go by, which, when a Man has rightly found out his Diſtemper, he can beſt judge how to apply proper Remedies for his Diſtemper, let it be what it will.

Now if a Horſe be griped in his Guts, or in his Bowels, or if he be bound in his Body, and the Wind cannot break

Way through him, that puts the Horſe into violent Pain, and makes him ſtrain to dung and ſtale, and can do neither: and if a Man has not a right Underſtanding of his Diſtemper, but gives him a ſtrong Purging Drench, thinking to carry it off, that is the Way that many a Horſe is killed, for where one is cured, two are killed by this very Thing; I know it to be true, for their Purges muſt be very ſtrong made, or elſe they could not work ſo ſoon as they do, for they are made of Jalap, Aloes, and Quickſilver; and if the Horſe can neither dung or ſtale, how can his Phyſick work? No, not at all, for he can bring nothing upwards, and for want of working downwards, his Belly will ſwell like a Drum, and he will die in two or three Hours Time. Don't you think this Man has committed a great Error in ſo doing? Yes certainly, for now I will ſhew you how, and in what Manner he might have prevented this grand Miſtake, I will leave you to judge of the ſame; for when a Horſe is bound, he ought to be rak'd, and that very well, then give him a Clyſter that is proper, then ſee how he goes on a little while, and if you ſee Occaſion you may rake him again, and give him another Clyſter, and when you have ſo done, you may give him a Purge, and when you can get the Phyſick quite through him, there can be no great Danger of killing him.

It's not a Man's knowing all the Drugs in an Apothecary's Shop, nor all the Herbs in a Field, that can make him Maſter of his Buſineſs; for a Man that is Maſter of that Art, is to find out all the Diſtempers that belong to a Horſe, and where his Ails lie; then if he knows that, he will always have a Caution, how he muſt make his Remedies, for fear of Accidents; for ſometimes a Thing that is mild takes as much Effect as the ſtrongeſt Thing you can prepare: for when a Horſe is in this Condition, as I have been ſpeaking of, and you give him a ſtrong Doſe of Phyſick, it checketh, and is a preſent Remedy, Kill or Cure; and if a Man cures one Horſe, and kills another, I am ſure that can be no Judgment, but a great Folly, both to his Maſter and himſelf, if he were made ſenſible of it by a Man that is a Judge of it.

And the ſame Rules are to be obſerved in outward Accidents, that is, any old Ulcers that have been of a long time ſtanding; when you ſend for a Farrier, and he looks upon it well, he will ſay, Sir, I hope I can cure it; then he goes to work for a Week or a Fortnight; then the Maſter wants to know if he thinks he will do well or not, then he ſays, I am in hopes he will, and perhaps he knows no more than he did the firſt Time of his coming to him; and this is the Way of a great many Farriers who are not Maſters of their Buſineſs; but a Man that is Maſter of his Buſineſs, can partly tell if he can make a Cure, or not, in that Time, or whether the Ulcer proceeds from the Fleſh or Marrow; if it proceeds from the Fleſh, it may be cured, but if it proceeds from the Marrow, it cannot be cured, for many times the Humours proceed from the Dam, and if it happens in their Heads, or upon their Backs or Legs, then there can be no Cure ſo long as he lives; but if a Man will, he may tell his Maſter he will do well, and ſo carry it on a long time, and at laſt he ſays, it has got to the Bone, and cannot be cured.

Now there is all your Charges loſt, beſides the keeping of the Horſe: What a Folly is this in theſe Men, who know no better? And this is the Miſtake which theſe make in Farriering.

I will now give you ſome Encouragement in what Care a Man takes that is a Judge of it, for his own Character, and in Juſtice to his Maſter: When you ſend for this Farrier to ſee the Horſe, and if he be Sick or Lame, he will ſtrictly examine into him to find out his Illneſs, and when he has ſo done, he will tell you the beſt of his Judgment; if he is very bad, he will tell you he is afraid he will die, but ſays, if you pleaſe, I will give him ſomething that is proper for him, and take all the Care I can. Then he will give him a mild Drench or two, that will work mildly upon him, which is far better than a ſtrong Doſe of Phyſick to kill him, for Nature will do its Part; this is the Judgment of a Man that does Juſtice both to you and himſelf; for in a Week, or Fortnight's Time, he can tell whether he can cure him or not; this is the Truth and Juſtice of a Man that is Maſter of his Buſineſs.

And 'tis all the ſame in Lameneſs, for if it be an Ulcer, he can tell you whether he can make a Cure or no in a ſhort Time; for if a Man be Maſter of his Buſineſs, he will juſtly tell you his Opinion; for if his Medicines do not take Effect in a ſhort time, he has no Hopes of a Cure; but if it take Effect in a little Time, there is Hope, and he will take all the Care he can to make him ſound; and that is the true Rule of a Farrier to find out the Nature of his Diſtemper; then when he has found out his Diſtemper, he makes up his Remedies accordingly.

And I hope you will allow that Man to be a Judge in this Affair, for he takes as much Pains in it as a Doctor, or an Apothecary does of his Patient; for ſometimes he has that Bleſſing, that he can tell where the Pains lie, and how a Horſe is in his Body, by the Motion he makes with his Head, or his Legs, for there are no other Rules to go by; for if a Man be ſick, and ſends for an Apothecary, he firſt tells him where his Illneſs lies before he can proceed to give him any Thing, which is the very ſame Caſe; for if he don't firſt know his Diſtemper, he can never make a Cure, but all the while he is picking your Pocket by his own Ignorance, and there are a great many have found it ſo, I am very well aſſured on't; for there are a great many Ulcers in all Parts of a Horſe's Body that can never be cured, for they bring them into the World with them. Sometimes they breed by a Pinch or a Blow, or a Prick that may happen, and the Humours ſettle there, which can never be cured; you may give him Eaſe for a little while; and that is the Reaſon there are ſo many Horſes loſt by not having good Breeds, and thoſe that are not perfectly ſound, tho' a Horſe that is ſound has Accidents happen to him, yet take it in Time, and a Man that is a Judge ſeldom fails of a Cure; becauſe there are no bad Humours attend it, but the Anguiſh only that a Horſe receives in his Wound.

RULE *the* SEVENTH.

Seventhly and laſtly, I ſhall ſhew you ſome brief and plain Rules concerning your Horſe's Health, and how your Care ought to be taken, and how Accidents may be prevented, which has been greatly neglected both by Maſters and Servants.

Now concerning Health, which is the firſt and principal Thing, I ſhall ſhew you, that when you have taken all the Pains, and followed all the Rules which I have given you, for the breeding and preſerving your Foals 'till they be fit for the Buſineſs which you deſign them for, then Care muſt be taken as to their Exerciſe and Work; let a Foal's Buſineſs be what it will, if you uſe him well, he will take a great Delight in his Buſineſs, as well as you do that ride him; and be ſure you don't ride him out of Reaſon, one Gentleman againſt another, by making of Matches, one ſtriving againſt another as long as they can run; you muſt think it will be a great Detriment to him in ſo doing, which may endanger his Health, by giving him Heats and Colds, which oftentimes endanger his Life, if great Care be not taken afterwards.

There is another bad Article, and that is in Hunting; ſome Gentlemen, when the Sport begins, will ride as hard as they can, and as much more Ground as they need, and if the Sport holds long, (which oftentimes it does) then he that takes Care, and rides ſoftly at firſt, will be the firſt that comes in; ſo you whip your Horſe, and ſtrain him to get in as ſoon as poſſibly you can; thus by Want of Care and Judgment you ſpoil your Horſe by ſo doing, and weaken his Conſtitution, and ſometimes break his Wind, or other Accidents of this Kind; for a Horſe has a bold Spirit, and if you keep no Guard on him, what can you expect but to deſtroy him of his Health?

There is another bad Article, and that is, in jumping your Horſes: you muſt give him proper Time to take his Leap, (that is at a Stile, or a Gate) for if you check him, he will be apt to ſlip; then if his Leg ſhould happen to ſlip into the Gate or Stile, he may ſpoil himſelf by one Means or another, which is a great Fault committed by not taking Care, and ſometimes by jumping at a Hedge, or a deep Ditch, when you have been riding hard, you ſhould have a great Care; for when you find your Horſe weak, you ought not to ſpend him; for if he drops on the Hedge, 'tis ten to one but he ſtakes himſelf; and ſometimes when he is weak, and jumping at a Dike, he tumbles backward into the Dike, and a great many more Accidents may happen by thoſe who are not careful in Riding, and are not Judges therein; I will therefore give you a Rule or two in a brief Manner concerning Riding, that is, if your Horſe be of a bold Courage, you muſt always be upon your Guard, keep yourſelf in a ſteady Poſture upon his Back, and draw him in with a ſteady Hand, and not ſpend him at all; then if you ſhould have any Occaſion to jump him, give him proper Time to take his Leap, then he will be chearful, and not diſheartned; let him have his Head by a ſteady Hand, then he will perform his Work to your Mind, and always obſerve to favour him as much as you can.

Now if the Sport or Exerciſe you follow ſhould hold long, your Horſe will come in the firſt, and have the Pre-eminence of the Field; and this is the Art of Riding: and you that have a good Horſe, and are deſirous to preſerve his Health, muſt always obſerve to let him have all the Advantage you can give him in hard Riding; for a Horſe of a bold Courage, when he comes among other good Horſes, will work one againſt another, let their Buſineſs be what it will.

And you that ride them, Maſters or Servants, if they be good Horſes, and you give them their Liberty to do what they will, they will break their Conſtitutions, and deſtroy their Health, and in a little Time they will come to be Food for the Dogs, and are deſtroyed in the prime of their Years.

But a Man that is a Judge in Riding, and preſerves his Horſe's Health, then he will have his Pleaſure in ſeeing what a fine Creature a Horſe is, when he is in perfect Health, and how he will perform his Buſineſs with all the Pleaſure imaginable; for all Men upon Earth will allow, that a Horſe is the uſefulleſt and fineſt Beaſt in the World; ſo the Thing you are to do is, to chuſe good Breeds, and the laſt chiefly depends upon your Care.

Now I have gone through the Seven Rules, ſhewing you all the plaineſt Methods which by any Means I could find out, and I hope thoſe that deſire to dive into this Affair will make Uſe of them; and I hope, with the Bleſſing of God, and your Endeavours, you will find they will anſwer your Ends, to your entire Satisfaction.

The next Thing I ſhall take Notice of concerning this noble Creature, is his true Shape, and the Points, which are in Number 32, as you find by the following Scheme.

1*ſt*, The Hoof.	1
2*d*, His Coffin-Joint.	2
3*d*, His Paſterns.	3
4*th*, That is, his ſhort Joints.	4
5*th*, His Shin-bone.	5
6*th*, The Knees.	6
7*th*, That is, from his Knees to his Shoulder.	7
8*th*, His Shoulders.	8
9*th*, His Breaſt.	9
10*th*, His Neck.	10
11*th*, His Ears.	11
12*th*, His Forehead.	12

13*th*, His Eyes. 13
14*th*, The Hollowneſs of his Brows. 14
15*th*, His Jaws. 15
16*th*, His Noſtrils. 16
17*th*, His Mouth. 17
18*th*, That is, the true Shape of his Head. 18
19*th*, His Mane. 19
20*th*, His Withers. 20
21*ſt*, His Back. 21
22*d*, His Sides. 22
23*d*, His Belly. 23
24*th*, His Flanks. 24
25*th*, His Rump. 25
26*th*, His Thighs. 26
27*th*, His Stones. 27
28*th*, His Tail. 28
29*th*, His Truncheon. 29
30*th*, Like a Stay, lower before than behind. 30
31*ſt*, His Hams. 31
32*d*, That his Hoofs be large and crooked, like thoſe of a Hart. 32

Now the Number of Points are particularly ſet down in the aforeſaid Scheme, and they are all in the Number of the Seven Rules concerning the Shape of a Horſe; ſo if theſe Points be all well fixed one to another, then he is ſaid to be a well ſhaped Horſe; and they be as true as ever I could find out in any Rule I could go by.

In the next Place, I ſhall proceed to give you ſome Account of the true Frame of a Horſe's Body, that is, the Number of his Joints, and how they are placed, which may be of Service to you, if they ſhould happen to be out of Joint; for there is no certain Cure; but for a Strain there is Help, if proper Remedies be applied for the ſame.

I will in the firſt Place begin at his Head, which is his Forehead, and the lower Part of his Jaw, which are 2
And from the Top of his Head to the End of his Tail, are 56
The Breaſt Bone is fixed to the Ribs, and ſupports the Shoulders, which is but 1

Carry over 59

Brought over	59
And the Joints that are from the Coffin-Joint to the Top of his Shoulders, and all their Supporters that uphold the Joints of both his Fore-legs, are	22
And the Number of Joints of his Hind-legs from the Coffin-Joint to the Hip-bone, or his Rump, or his Dock, are	24
And his Ribs are the Proportion of his Body.—	32
And there are as many ſhort Ribs as there are long ones, which are to ſtrengthen his Back, and a Guard for the other Ribs, ſo that he is able to carry his Burthen, without his Back being broke	32
So the Total Number of what you may call proper Joints, is	169

Courteous Reader, I have now ſet down the Number of Joints belonging to a Horſe as near as I can, according to the beſt of my own Judgment, which you will find ſet down in the Scheme above-mentioned, which are 169. Some aſſert there are 177, but they cannot properly be called Joints, for they are only little Supporters that attend the Joints to ſtrengthen them, and to keep them in their proper Places; or elſe how could the Horſe bear his Labour, or ſuch heavy Burthens as they carry? If they were not well fixed, and made of a wonderful Strength, they could not endure it, for it is thought he is one of the ſtrongeſt and fineſt Creatures in the World, and the moſt ſerviceable of any Beaſt whatſoever; and ſo every one ought to think it a great Bleſſing, that God Almighty has given them the Benefit and Uſe of ſuch a noble Creature as a Horſe.

Having now gone through the Seven Rules, which I have endeavoured to lay down in a plain Manner, ſo that any one may underſtand it that can read; I heartily wiſh, that they, whoſe Hands this Book ſhall light into, would take as much Delight in making Uſe of it, to follow the Directions I have given them, as I have done in Penning it: All which cannot but be of Uſe, as well as Diverſion, to all thoſe who delight in good Horſes.

For the Remedies, if Accidents happen.

NOW concerning this Affair, I ſhall give you ſome Account in the other Part of this Book; that is, concerning the Remedies which I have preſcribed in Sickneſs or Lameneſs; you will find Receipts for all kinds of Diſtempers, which I have found to be good by my own Experience, and very ſafe, if they be rightly prepared, according to the Diſtemper, by a Man of Judgment.

Now I have put you in a Way how the Horſe is to be managed during his Sickneſs or Lameneſs, and how to prepare his Phyſick without any Danger, and if a Man can but find out his Illneſs, 'tis but your looking into the Book, where you may find a Remedy for his Diſeaſe, which, if one won't do, you may give him another when you think proper, without any Danger at all, for there are no ſtrong Doſes of Phyſick to gripe him, or rack him to Death in two or three Hours Time, as many have done by giving them thoſe ſtrong Doſes, for Nature muſt do its Part; and if any Ulcers happen, you have likewiſe Remedies for them, which I hope will anſwer your Expectation, and give you good Satisfaction in what you take in Hand.

The End of the FIRST PART.

PART II.

THERE are many Farriers and Grooms who are of that Opinion, to purge and bleed their Horſes three or four Times in a Year, let them be ſick or well, it is all the ſame; which I think is a quite wrong Notion, for if a Horſe be in good Health, there can be no Occaſion for Purging or Bleeding, for the good Blood comes from him as well as the bad; and Purging puts the Horſe out of Order when he is well, ſo I cannot find any Reaſon for it when he is in a good State of Health; but very often wants good Dreſſing, good Feeding, and good Exerciſe, except the Horſe has been uſed to it, or has Humours attending him, then Purging and Bleeding is proper, for he will not do without it; or if any Accidents happen to him, Purging and Bleeding is very proper, and here you will find Remedies for the ſame.

1. *A Clyſter for a ſimple continued Fever.*

Take Mallows and Marſh-mallows, of each a large Handful, Camomile half a Handful, Fennel-ſeeds three Drams, or half an Ounce; bruiſe them and boil them in three Quarts of Water 'till one Quart be conſumed; then ſtrain it through a Sieve, and diſſolve in it three Ounces of Lenitive Electuary, and a Quarter of a Pound of Hog's Lard, Oil, or Butter.

2. *His Water-Drink.*

Put a Quart of Water, with two Ounces of Salt of Tartar, into a brazen Pot with a Cover, and ſet it over the Fire, 'till the Salt be diſſolved; then pour the Water into a Pail, and after the ſame Manner diſſolve one Ounce of Sal Armoniac beaten to Powder, into another Quart of Water; mix this laſt Solution with the former, and fill up the Pail with common Water, and if your Horſes refuſe to drink it, add a little Barley Flour to qualify the unpleaſant Taſte.

3. *For a Sweat.*

Take three Pints of Milk-Water, and diſſolve in it an Ounce of Mithridate; and when he begins to ſweat, give him warm Water to drink, and clothe him up warm. If the Fever ends with Rheum from the Mouth and Noſe, boil a Handful of Red-roſe Leaves in a Quart of Water, diſſolve in it an Ounce of Diaſcordium, to be given as a Drench.

4. *For a Surfeit.*

Take Senna one Ounce, ſweet Fennel-ſeeds, Coriander, or Carraway-ſeeds, of either, Half an Ounce, Salt of Tartar one Dram; infuſe them in a Quart of boiling Water, paſs it through a Sieve, and add to it an Ounce of the Powder of Jallop; to be given in the Morning, and the Horſe kept faſting for the Space of four Hours before and after it; when it begins to work, his Water ſhould be warm, ſtrewed with Oatmeal, or Barley-flour, and nothing given that is cold.

5. *Starves, or Staggers, a Clyſter.*

Take two bitter Apples, boil them in five Pints of Water, pour off the Liquor, and mix it with three Ounces of the Juice of Buckthorn Berries, or four Ounces of the Syrup; the ſame Quantity of Oil or Butter.

6. *Another for the ſame. A Purging Drench.*

Boil one bitter Apple in a Quart of Beer, ſtrain it off, and when it is almoſt cold, add to it an Ounce and a half of Jallop, and two Drams of Diagridium; theſe may be repeated two or three times, if the Horſe has Strength to bear it.

7. *For his Dreſſing.*

He ought to be exerciſed and rubbed very well down, and while he is under ſuch Courſes of Phyſick, his Water ſhould be warm, and ſprinkled with Oatmeal.

8. *For a Wound or Blow on the Eye.*

The firſt Thing to be done in this Caſe is, to open the Neck-vein, taking from thence a moderate Quantity of Blood, and after that, take Conſerve of red Roſes, ſpread it pretty thick on a Pledget of fine Flax, or clean Hurds, and lay it over the Eye, applying at the ſame time above the Eye pits, and about the Temples, Flax dipped in a Charge made with Vinegar, the White of an Egg, and Bole Armoniack; this, by allaying the Heat, will put a Check to the Blood.

9. *For Rheum and Inflammation in the Eyes.*

Take white Vitriol half a Pound, Roch Allom three Quarters of a Pound, an Ounce and a half of Bole Armoniack, Litharge half an Ounce; reduce all theſe to Powder, then put them into a new glazed earthen Pot, with a Pint and a half of Water; boil it over the Fire without Smoke gently, till the Water is all evaporated, and the Powders are perfectly dry at the Bottom, ſo let it remain till the Matter is cold. This is called the *Lapis Mirabilis*, or the *Wonderful Stone.*

Put half an Ounce of this Stone in a Glaſs Bottle, with four Ounces of Water, it will make the Water as white as Milk in a Quarter of an Hour; waſh the ſore Eye Morning and Evening with the Water or Solution. A Solution thus made, will keep twenty Days.

10. *A Receipt for the ſame.*

Take Roman Vitriol and Bole Armoniack, of each one Ounce, Camphire a Quarter of an Ounce, powder them together, and put half an Ounce of this Powder into two Pounds of boiling Water, ſtir it well about, then take it off the Fire, and let it ſettle, and decant off what is clear by Inclination. This is an excellent Remedy, and may anſwer the End as well as the other; it may be made ſtronger or weaker, as the Practitioner ſhall ſee Occaſion.

11. *For Lunatick, or Moon-Eyes.*

The chief Thing that is to be done is Purging; but firſt open him with a Clyſter or two, and then let Purges be given him as follow: Take of the cleareſt ſhining Aloes two Ounces, Turbith Root in fine Powder half an Ounce, Diagridium two Drams, Liquorice Powder four Ounces; make them into large Balls with a ſufficient Quantity of freſh Butter; let theſe be given in Ale to waſh them down.

12. *A Purge.*

Take Aloes and Jallop in Powder, of each one Ounce and a half, Cream of Tartar three Ounces, Diagridium one Dram, let this be given in a Quart of Ale without warming, or it may be made into a Paſte with Liquorice Powder and Butter as the other; and the Cream of Tartar may be diſſolved in warm Water, and given him after it begins to work; and the Horſe muſt be purged very often, if his Strength will bear it. And to waſh his Eyes you will find a Receipt in Page 345. N°. 10, for *Eye-water.*

13. *For Films, Webbs, or Dimneſs of Eyes in Horſes.*

Take unſlacked Lime four Ounces, and pour upon it a Quart of boiling Water, and after 'tis clear, pour it off gently from the Lime, and then filter it through brown Paper into a clean Braſs or Copper Pan, and diſſolve in it one Ounce of Crude Sal Armoniack, letting it ſtand in that Veſſel till it turns to a very beautiful blue Colour, then filter it as before; let four or five Drops of this Water be inſtilled every Day, once or oftner, as there ſhall be Occaſion, into the Horſe's Eyes: This Water will keep a long while, and is not only uſeful to Eyes, but to waſh all old obſtinate Ulcers, and therefore may at any time be made in larger or leſſer Quantities as you think proper. He ought to be bled, purged, and rowelled, according as you find him in Caſe to bear it.

14. *For Cold Clyſters.*

In the Beginning for a Cold, Bleeding and Clyſters. Take Mallows and Marſh-mallows, of each three Handfuls, boil them for the Space of half an Hour in three Quarts of Water, and ſtrain it off, add to it half a Pound of Treacle, coarſe Sugar or Honey, and the ſame Quantity of Oil or Butter; let it be Blood-warm, and repeated as often as needful, and hold the Tail as cloſe to him as you can.

15. *For a Clyſter, a Drench, or Balls.*

And after the laſt give him Garlick, Onions, Brimſtone, Honey, Barbadoes Tar, or common Tar; they often ſucceed, and that very ſoon.

16. *A Drench.*

And after the Drench, to ſweat him, give him an Ounce of Venice Treacle in a Pint of Treacle-water, and clothe him warm, and he will ſweat; dreſs him, and give him moderate Exerciſe; and take care that he don't get any freſh Cold on him.

17. *For Cheſt-Foundering.*

Bleed your Horſe in the Inſide of the Thigh, which will be found much more ſafe, and anſwer the End much better than Bleeding in the Neck; then give him a Clyſter that is for a Cold.

18. *To Sweat him.*

Take Milk-Water one Pint and a half, Treacle-Water half a Pint, diſſolve in the Treacle-Water ſix Grains of Camphire; then add an Ounce and a half of Mithridate, or two Ounces of *London* Treacle; mix all together, and give it to your Horſe.

19. *For Balls.*

Give him one in the Morning, and one at Night. Take Conſerve of Red Roſes two Ounces, Sperma Ceti one Ounce, Linſeeds and Fenugreek-ſeeds in Powder, of each one Ounce and a half, Liquorice-Powder two Ounces; let theſe be made into four Balls, with Sweet Oil, or Oil of ſweet Almonds; by Degrees give him his Exerciſe, which, with a cleanſing Diet, will perfect the Cure. Give one Ball an Hour before watering Time.

20. *For broken-winded Horſes.*

Take four Heads of Garlick, one Ounce of Horſe Radiſh, ſtamp them in a Mortar, then add an Ounce and a half of Brimſtone, and work them up into two Balls with as much Sweet Oil as is ſufficient, one to be taken in the Morning, and the other in the Afternoon; and all the Remedies in a Cold are alſo profitable and uſeful in this Caſe. Give him ſometimes ſcalded Barley inſtead of Oats, and nothing will be more proper than Barley boiled in his own Water with Liquorice, which he will drink with Pleaſure, after he has been uſed to it.

21. *For Glander'd Horſes.*

Take the Roots of common Burdock ſliced one Handful, of Guaiacum and Saſſafrax Wood, of each half a Pound, Monks Rhubarb four Ounces, Senna one Ounce, Salop bruiſed two Ounces, Sweet Fennel-ſeeds, or Anniſeeds, one Ounce and a half; boil the Burdock Roots and the Woods in two Quarts of Water for the Space of a whole Hour: After that put in the other Ingredients, and to a Quart of the ſtrained Decoction add a Quarter of a Pound of Honey: Let this be given in the Morning, and let his Water alſo be warm, and ſweetened with Honey.

22. *A Clyſter for the Dry-Gripes, and Pain in the Bowels.*

Take the Leaves of Mallows, Marſh-mallows, and Mercury, of each three Handfuls; boil them in three Quarts of Water for the Space of half an Hour, and ſtrain it; add Lenitive Electuary four Ounces, Spirits of Wine or Brandy half a Pint, Oil or Butter half a Pound: Let theſe be infuſed lukewarm into his Body: if the Horſe has had a long Time a Looſeneſs and Cholic pains, it proceeds from Wind and Phlegm. The following Clyſter may be given him as the former.

23. *Another for the ſame.*

Take Red Roſe Leaves two Handfuls, Tops of Centaury, the leſs, and Wormwood, of each one Handful; boil them in two Quarts of Water to three Pints, and in the Decoction diſſolve two Ounces of Diaſcordium, and add half a Pint of Treacle-Water, or Spirits of Wine; this will take off the Pain, and lie in his Bowels like a Cordial; and in a Minute's Time will take off the violent Gripes; and in a Quarter of an Hour the Horſe will riſe up to feed, that before was like to daſh out his Brains againſt the Wall. Purging if you pleaſe.

And after that I recommend gentle Purging with ſuch Things as are hot and penetrating, (and this I do contrary to the Opinion of moſt Farriers) which by gentle Purging cuts and deſtroys the violent Cholic Pains and by that all the Stoppages of the Bowels are removed; and if he be bound in his Body, he muſt be raked, and the former Clyſter be given him; then purge him with ſuch Things as you think proper.

24. *For the Bloody Flux.*

Bleed your Horſe in the Neck-Vein about a Quart, and then give ſuch Clyſters as I recommend following. Take Guaiacum half a Pound, Saſſafrax four Ounces, boil them in four Quarts of Smith's Water wherein they quench their hot Irons, until one half be conſumed; then put to the ſtrained Water Red Roſe Leaves, the Tops or Leaves of Briars, and the Leaves of Brambles, of each one Handful, or inſtead of theſe, two Handfuls of Plantain; and when it has boiled a Quarter of an Hour longer, take it off the Fire, and into the ſtrained Liquor diſſolve four Ounces of Diaſcordium, and Opium half a Dram.

25. *A Clyſter of the other.*

Take a Quart of the aforeſaid Water, warm it over the Fire, and diſſolve in it two Ounces of Diaſcordium, and the like Quantity of Roch Allom; or you may put in it the Bark of an Oak Tree two Ounces; but you muſt boil the Water firſt: All Clyſters that are for the Bloody-Flux muſt have no Oils, nor greaſy Ointments in them.

26. *Of Worms, Butts, and Truncheons.*

Theſe happen among all young Horſes, ſo I recommend to you the following Clyſters and Purging. Take Tanzy Flowers and Coraline, of each one Handful, Senna one Ounce, Salop in groſs Powder half an Ounce; boil them in a Quart of Water, and to the ſtrained add two Ounces of Syrup of Buckthorn.

27. *Another Clyſter.*

Take two Ounces of theOunteſs of *Warwick*'s Powder, and give it in Decoction wherein Rue has been boiled; let your Horſe be kept from feeding two Hours before and after his Doſe; give him moderate Exerciſe to help the Operation of the Phyſick, and at Night he may have ſcalded Bran to eat.

28. *The Purges for the ſame.*

Take of the beſt of Aloes one Ounce, Mercurius Dulcis half an Ounce, Diagridium two Drams; make theſe into a Ball with Liquorice Powder, or Flour, and as much Butter as is ſufficient.

29. *Or this Purge.*

Take of the beſt ſhining Aloes one Ounce and an half, Ethiops Mineral one Ounce, Diagridium, and Diaphoretick Antimony, of each two Drams; make them into one or two Balls, as before directed, and let them be given faſting; either of theſe, being three or four times repeated, will deſtroy all manner of Worms, and carry off that ſlimy and corruptible Matter in which they are engender'd, and without the leaſt Danger: Mercurius Dulcis may be had at any of the Apothecaries; and as to the Ethiops, it is made of equal Parts of Quickſilver and Brimſtone, rubbing them in a Mortar till they are incorporated, and turn to a black Powder.

30. *Clyſters for Pain in the Bowels by Accidents.*

Take two Quarts of warm Water, and diſſolve in it half a Pound of Epſom Salts and two Handfuls of common Salt.

31. *Another.*

Take two Quarts of warm Water, Aloes in Powder two Ounces, Gamboge one Ounce; let theſe be ſtirred into the Decoction when it is about Blood warm, adding at the ſame time, a handful of Bay Salt, or common Salt; and, to comfort his Bowels, the Preſcrib'd, in the preceding Direction, to eaſe violent Pains in the Bowels. This Clyſter may be given him for the dry Gripes.

32. *For the Yellows or Jaundice.*

Take Caſtile Soap one Ounce, cut into Slices, and diſſolve it in two or three Spoonfuls of Whey, or any other Liquid; after that, put in two Ounces of live Honey, and Powder of Turmerick, as much as will make it into two Balls; and after you have dipped them in Sweet Oil, give them to your Horſe, letting him faſt two Hours before and after; this muſt be repeated every other Day for a Week at leaſt. But in this Caſe, the Uſe of chewing Balls, or champing green Juniper Wood, Horſe Radiſh, or any ſuch thing that will rouze the Spirits, muſt needs be of great Service to him, and he ought to have Exerciſe every Day given him that is proper for him. And if he be in Pain, he will turn his Head to his Side, and make a prancing with his Feet; in that Caſe he muſt be bled, and moderately purged two or three times, if the Horſe be of a ſtrong Conſtitution.

33. *For the Farcin.*

This is a Diſtemper that trieth the Skill of Farriers the moſt of any, for it is very troubleſome in all Caſes whatever, there being two or three Sorts of the Farcin, as the Inward and the Flying, and the Yellowiſh and the Blackiſh, and puts forth Buds reſembling a Hen's Fundament. I will give you a few Directions concerning the ſame.

34. *Begin with Purging.*

After Bleeding, moderate Purging may be complied with. Take Aloes in Powder, and Myrrh, of each one Ounce; Diaphoretic Antimony, half an Ounce; Jamaica Pepper two Drams; make them into Balls, with a ſufficient Quantity of Flour and Honey. This is ſo mild, that it may be given almoſt to any Horſe.

35. *Another ſomewhat ſtronger.*

Take Aloes two Ounces, Salt of Tartar two Drams, Gum Guaiacum and Ethiops Mineral, of each half an Ounce; make them into Balls as the former.

Either of theſe may be given, according to the Strength of the Horſe; always obſerving that he drinks nothing but white Water warmed, until the Phyſick be quite gone out of his Body; which, if he be purged three times, will be about a Week or ten Days after the firſt Doſe.

36. *Another.*

Take of Rue the tender Tops and Leaves, without any of the leaſt Stalks, a good Handful; firſt chop them ſmall, and then ſtamp them in a Mortar to a very Ointment; when they are well pounded, put thereunto of the pureſt white tried Hog's Greaſe one Spoonful, and ſo work them together to a perfect Salve or Ointment; this done, ſtop into either Ear this whole Quantity by equal Portions, and put a little Wool upon the Medicine to make it keep in the better, and ſo ſtick up his Ears, and let him remain in the

Stable 24 Hours at the leaſt, and then unſtick his Ears and take forth the Wool, and either put him forth to Graſs, or work him moderately; the ſooner he is cured.

37. *Another.*

Take common Turpentine four Ounces, Quickſilver two Ounces, incorporate them in a Mortar until the Quickſilver is killed, and the Ointment turns to the Colour of Lead; ſpread this upon Tow or Flax, and put it into the Holes of the Buds, or anoint the Knots, or waſh the Sores with Lime-water, or Vitriol-water; when they begin to die, then anoint them with Hog's Lard and burnt Allom, but not before, leſt you turn the Humour back again.

When you are very ſure you have killed it within, give your Horſe thoſe Things that are purging and opening, and you will not fail of a Cure. But conſider the Horſe's Strength, and ſuit his Condition. If theſe Directions, with a right Preparation of theſe Things which I have preſcribed, will not make a Cure, you had better give him to the Dogs, leſt he be of a greaſy Nature.

38. *For the Mange.*

You may bleed your Horſe in the Neck, but not much, then purge him. Take Senna 1 Ounce, Talapin in groſs Powder 6 Drams, Roots of ſharp-pointed Docks 1 Handful; ſlice the Roots, and boil all together in three Pints of Water to a Quart; paſs the Decoction through a Sieve, and add to it two Ounces of Buckthorn Syrup. You may purge him two or three times, and bleed once: In his Corn you may give him Brimſtone and Liquorice together, made into Balls, one at a time. And to anoint him, you muſt put Brimſtone and Hog's Lard, and burnt Allom; or you may waſh him with old Chamber-lye and Tobacco-ſtalks, with a little Oil of Turpentine; put all together: Or you may waſh him with Vitriol-water, or Copperas-water: This will kill the Mange if not of a long Standing: You may uſe Quickſilver and Turpentine, Hog's Lard, or Butter.

Some uſe Arſenick and Quickſilver, and all other burning Remedies; but pray take very great Care how you uſe them.

39. *Of Wounds.*

I ſhall here give you a few Directions concerning Wounds; if they be freſh and in the fleſhy Part, they will be the ſooner well.—You may dreſs the Part with Honey and Turpentine, Hog's Lard, Verdigreaſe, and burnt Allom, all melted together; and you may waſh his Wound with Vitriol-water, or Copperas-water, and any Stale or Lee that is old, heating it hot; or any Greaſe or Ointment; or you may dreſs the Wounds with Spirits of Wine, or Brandy, or Spirits of Camphire, which are very proper in all Wounds, old or new. But when they are in the Legs, or amongſt the Sinews, you muſt take care you do not hurt the Sinews: You muſt not uſe any cauſtick Medicines, as Arſenick, or Mercury, Vitriol, or Quickſilver, for thoſe Things are very injurious in thoſe Parts. But if they be in the fleſhy Parts, you may uſe thoſe Things, if there be Occaſion, to take down the proud Fleſh, and clean the Wound; then heal up the Sore with thoſe Things above-mentioned; but if the Wound be torn very deep, you muſt ſtitch up the wounded Part with two Stitches juſt in the middle; and if there be a great deal of Blood, you may ſtop the Wound full of Salt, or you may put in Lint dipt in Vitriol-water, and in three or four Days you may cut the Stitches and clean the Wound; but you muſt dreſs the Wound the next Day with ſome mild Ointments, ſuch as are proper for any new Wounds.—You may uſe Mutton Suet, Hog's Lard, or common Turpentine, or Honey, or any Spirits you may waſh the Wound with, as before mentioned.

40. *Concerning Ulcers, or hard Swellings.*

If a Wound be turn'd to a ſtinking Matter, that is, a great Running, and full of rotten Fleſh, full of Holes, it is ſaid to be an Ulcer; and when it is ſo very bad, to begin the Cure you muſt clean the Wound with Mutton Suet boiling hot, and ſearch for the bottom of the Wound; and when you have found out the Cauſe of the Thing, you will know the better how to go on.

The next Thing to be done is, you muſt put in Vitriol-ſtone, or Arſenick, or Mercury; put ſome into every Hole, as much as you think proper to bring out the Core, and in forty-eight Hours you will find the Core to be looſe, and then you muſt put in a little burnt Allom and Verdigreaſe, or a little Vitriol; and when the Core is quite out, and the

Wound well cleaned, you muſt be ſure to waſh it well with ſome Spirits of any Sort, and then you may anoint the Wound with Honey or Hog's Lard, or Turpentine; or you may anoint it with Ointment of Tobacco, or any other greaſy Ointments; but if the proud Fleſh riſes up, you muſt touch it with a hot Iron, but very gently; but pray take care you do not touch the Sinews or Veins, if you can any ways help it; and if you do, pour in Ointment with Sweet Oil and Soap, to take the Fire out, and then go on as before-mention'd; and you muſt purge him and bleed him, and put a Rowel into his Belly, and keep his Body open with opening Things, if his Strength will bear it, and then you need not fear a Cure with Care.

41. *Of Swellings new or old.*

As concerning Swellings, whether new or old, or of a long ſtanding; which if they be new, anoint them with Brandy, or Spirits of Wine, or Camphire, the Oil of Worms, or Swallows, or Oil of Turpentine, and be ſure you have a good large hot Iron to keep in the Heat, there being nothing better than a Salamander, or a Bar of Iron that is thick, to keep in the Heat: And be ſure you work in Oils or Ointments with your Hands, and a hot Iron, and that will ſink the Swelling, and bring it to a Head; and you muſt feel with your Finger if it be ripe, and if it comes to a Head, and does not break of itſelf, you muſt take a little hot Iron, about the bigneſs of your Finger, and if you can come at the Bottom where it is ripe, you may burn a Hole about two Inches deep, and then the Anguiſh will come out; but if you cannot burn it, you muſt open it with a Launcet, and when it is opened, you muſt waſh it with Things that are proper, very hot, to heal the Wound, that you come to the Bottom of it, and then you muſt go on as in the Manner before mentioned; for then it is become an Ulcer, and you muſt uſe ſome cauſtick Remedy, which is Arſenick, or Vitriol, or Mercury, or burnt Allom, and when the Core comes out ſearch it well, and be ſure you are at the Bottom of the Wound. You may waſh it with Vinegar, or Vitriol-water, or Copperas-water, and then if it be clean, you muſt anoint it with greaſy Ointments, and waſh it with any Spirits or Brandy, to comfort the wounded Part, and I hope you will not fail of obtaining a Cure.

Take care that the Horſe does not catch Cold, and if you are afraid of a Mortification, you muſt make a Fermentation to bathe the wounded Part twice a Day, Morning and Evening, and make it with Emptyings of ſtrong Ale, or Lees of Wine, about two Gallons of Liquor, and then put in a handful of Hemlocks, and a handful of Mallows, Plantain, and Burdocks, Adders Tongues, and Adders Leaves, and Leaves of Horſe-radiſh, or any ſtinking Weeds that can be had; you may put a Pint of Spirits of Wine in it after it has boil'd an Hour or longer.——All theſe Things are to be had in the Summer; take a handful of each, and when you dreſs the Wound, you may lay on ſome of the Herbs when they are hot, which is very proper.

And when you have ſo done, you may pour in ſome Mutton-ſuet melted into the Wound, and then anoint it with Honey and Turpentine, and Ointment of Tobacco, and a little Tar: You may put into it a little burnt Allom, or take the Sole of an old Shoe, and burn it to Powder, and put into it, which is very proper to clean any Wound, and will heal up any Sore.

But if you have this Misfortune in Winter, you muſt make your Fermentation of the ſame Liquids, but inſtead of thoſe Herbs, you muſt put in one handful of Rue, one handful of Mint, and a handful of Thyme, a Pint of camphorated Spirits of Wine, or a Pint of Brandy, and half a Pint of Sweet Oil; and when you find that the Mortification is ſtopt, you may heal the Wound with thoſe Remedies of Ointments and Spirits before-mentioned, concerning *Wounds* and *Ulcers*.

And I hope, with Care, theſe Remedies will effect the Cure, if it has not taken the Brain.—If the Horſe be old, and poor in Fleſh, ſo that he is not able to go through his Cure, in that Caſe, you muſt give him two or three Doſes of Phyſick, and a Rowel or two, and you muſt purge him with thoſe before-mentioned, concerning Phyſick.

I have now given you ſome uſeful Directions concerning Wounds and Ulcers, the neareſt and ſafeſt Way that can be done without cutting, or thruſting in long Tents, which by cutting and burning many a poor Farrier has ſpoiled many a good Horſe for want of Judgment.

There are a great many more Remedies of this Kind, for Wounds and Ulcers, without cutting or burning, which I have omitted. I have juſt put down a few of the ſafeſt

Remedies as can be done in his Kind.—Which with Care, they will, I hope, anſwer your Expectation. I will now give you ſome proper Directions in the ſucceeding Rule, concerning the Biting of *venomous Beaſts*, as the *Biting of a mad Dog*, or *Adder*, &c.

42. *Of the Biting of venomous Beaſts.*

There are infinite Ways of curing thoſe Bites, ſome give Fire, and ſome cut out the Bit that is wounded; but theſe Operations cannot be allowed of in all Parts; but chiefly when the Wound is made in the Fleſh, and free from the Nerves and Sinews: Others only apply Garlick, Onions, Bay-ſalt, and Bacon ſtamped together into an Ointment; others ſtamp Rue, Muſtard-Seed, pickled Herrings, and black Soap. with a ſufficient Quantity of Deers Suet, or Bears Greaſe.

As for the *Biting of an Adder*, there is nothing better than Adders Fat to anoint the Wound with, or Greaſe, which you may always keep in Readineſs in a Gallipot, the Certainty of which has been experienced (and made Cures) by a great many eminent Phyſicians: You may anoint with Sweet Oil and Plantain, which are very proper. I ſhall next ſet down two or three Remedies concerning *Cauterizing and giving the Fire*.

43. *Cauterizing and giving the Fire.*

This is performed by an Inſtrument made hot; or by corroſive and burning Medicines, which is to keep down a Growth of fungous Fleſh, to eat away and deſtroy it, and moreover to ſtop up the Mouths of Blood-Veſſels, thereby to prevent an Hemorrhage of Blood; and when ſo done, go on with your Cure; but be ſure you make your Orifice at the Bottom of your Wound, and then put in little Soap Tents of Flax dipped in warm Baſilicon, or any other Ointments, and all the ſeared and burnt Parts ought to be immediately bathed with Spirits of Wine, and afterwards anointed with a Mixture of Bees-wax and Oil melted together, or with common Tar, until the Scars fall off; but if there be a very great Heat and Anguiſh, and a Tendency to a Swelling in the Legs, eſpecially of thoſe Horſes that are tender and waſhy; in that Caſe camphorated Spirit of Wine may be uſed two or three times a Day, or Recourſe may be had to Fomentations and Baths, or attenuating Oils, ſuch as the Oil of Earth-worms, or the Soldiers Ointment; for by theſe means the Grievance and the Burn comes ſooner to a Suppuration, and you may heal up the Wound with any greaſy Ointment above-mentioned, but you muſt take care you don't heat your Irons too hot; a Charcoal Fire is the propereſt for it, and when you take it off the Fire, rub it with a Woolen Cloth, for fear of any Dirt or Sand, and 'tis proper to have your Iron according to your Place; if it be in the Legs, a flat one is beſt, and you muſt draw your Strokes along with the Hair, but take care you do not touch the Sinews for fear of a Fever, and you muſt burn the Skin the Colour of a Cherry, but not deep; but if the Grievance happens in the Fleſh, you may uſe a round Iron or a ſquare one, and make your Orifice as proper as you can to diſcharge the Humours; and you muſt bathe the Wounds with Spirits and greaſy Ointments; and when you have brought it to a freſh Wound, you muſt heal it with Tar and Honey, Hog's Lard and Turpentine, and a little burnt Allom, which I hope will anſwer your End.

44. *Of Rowelling.*

Rowelling is an Artificial Vent made to diſcharge the Humours, and to drain any ill Humours from any Swelling, or any Wound, or a Strain, or Humours in the Eyes, or in any Part of the Body; Rowelling is very proper in all theſe Caſes; if your Horſe's Eye be bad, you muſt rowel him in the Head under his Throat, which is very proper; and if his Legs ſwell and run, you muſt rowel him in the Belly; or when the Swellings and Wounds happen in any other Part, you muſt put in your Rowel as near as you can; you muſt make your Orifice in a fleſhy Part as much as poſſible, becauſe you may raiſe the Skin for your Rowel, and the better for the Humours to drain off, and to put in the Rowel; but you muſt take care you don't cut too deep, for there are two Skins, and you muſt put the Rowel between them; and after that fill the Hole with Turpentine and Hog's Lard, and take care you don't cut any Veins or Sinews.

There are two Sorts of Rowels, a Hair Rowel, and a *French* Rowel; and I think the *French* Rowel is the beſt. Horſes that are poor, and hide-bound, and conſumptive, Rowelling does them harm; and ſo much for Rowelling.

45. *For Gelding young Colts and Horſes.*

The Gelding of a Foal is an eaſy Operation, and ſeldom is attended with any ill Accidents, if the Gelder be Maſter of his Buſineſs; but in an old Horſe there are ſome troubleſome Caſes, becauſe they being in Years, their Strength and Vigour decreaſes, or the Company of Mares may have over-ſtrained them, or a Bruiſe in their Bowels by any Accident that may befal them, as thoſe of nine or ten Years of Age; then ſometimes thoſe Horſes are in great Danger by Gelding.

If they have any of thoſe Accidents, the Gelder muſt take great care that he does take up all the Strings of his Stones, and ſear them with a well-poliſh'd Iron, and rub it very well on a woolen Cloth, for fear any Sparks or Dirt ſhould come off; then if any Accidents happen that Way, it is apt to create a Fever in the Bowels, or a great Swelling in his Sheath, and be ſure you bathe the Part with Spirits of Wine and Camphire, or Brandy; if he ſhould ſwell very much, make a Poultice with Cow-dung and Hogs-lard, or Oatmeal and Milk and Hogs-lard, and you muſt make him a Truſs of Flannel or Bays; cut it Three-ſquare, and put on three Strings of Tape, or Liſts, one of the Strings muſt go between his Legs, and the other two go up between each Side of his Flanks, and tie upon his Back all three Strings together, and you may anoint him with Marſh-mallows, and keep the Holes open with Hogs-lard, and keep him with opening Diet and moderate Exerciſe.

As for a Colt, there is no great Danger in him, when he is ſo young, if you keep the Holes open, and keep him from taking Cold; you may give him Barley-water to drink for two or three Days, and rowel him in his Hind-legs, or in his Belly, and if you are afraid of a Mortification, bathe him with a Fermentation, ſuch as is preſcribed in Page 354. N°. 41. *concerning Ulcers.* Now I have given you a true Account concerning Gelding, and Remedies for the ſame.

46 *For Docking of Horſes,* &c.

All that I intend to ſay upon this Subject is, to deſire you not to ſear your Horſes too much when you dock them, becauſe the Fire very often gets into his Back, and kills him, eſpecially when he is dock'd too ſhort, and a choice Horſe; but as for Mares, the Rule for them is, to cover their Bordens; and as for a Nag, what you may call a Hunter, to be as long as a Mare's, or longer, which is about ſeven or eight Inches long; and after he is well, you may nick him, and then he will have a fine Tail, and ſet it very well, if he be nick'd as he ſhould; pray let your Irons be heated in a Charcoal Fire, not red-hot, and well-poliſhed Iron, and very well rubbed, as before-mentioned.

47. *For the Lampers.*

The Lampers is a bad Thing, and very troubleſome to Horſes when they are young. It is a hard Swelling in the Mouth, which makes it very troubleſome for them to feed, and it is cured by applying a hot Iron, made for that purpoſe, and you muſt burn it, but not too deep, but even with the Roof of the Mouth, and rub it well with Salt, and give him ſcalded Bran, or raw Malt to eat, and he will ſoon be well.

48. *For Bladders, and other Diſeaſes in the Mouth of Horſes.*

The Mouth of a Horſe is ſubject to ſeveral Infirmities, that cannot be eaſily removed without the Fire, or ſome corroſive Medicine. There is the Gigs, which ſome call the Flaps; and as for Bladders, they, for the moſt part, grow on the Inſide of the Lips, and ſometimes towards the Palate; but for thoſe on the Lips, the uſual Method of Cure is, by ſlitting them open, and diſcharging the Matter out of them, and afterwards waſhing them with Salt and Vinegar. The Gigs are cured by clipping them off with your Sciſſars, or a Knife, and rub them with Salt; thoſe of the Lips are cauſed by ſome ruſty Bit, or by feeding near the Ground, or Pricks of the Buſhes in the Spring Time, which makes their Lips to ſwell, and very often it turns to Cankers; and to cure this, is to waſh with Vitriol-water, or Copperas-water, or Lime and burnt Allom; put theſe into a Quart of boiling Water, and make it as you think proper; and you may bleed your Horſe's Mouth with any of theſe Waters, which is very proper in all theſe Caſes, concerning the Gigs and Bladders, or the Cankers, or of any Diſtemper in the Head; or you may anoint your Horſe with Ointments that will kill and dry the Humours; Tar is very proper, and burnt Allom, or a little ſlack'd Lime is very good for it, or Sweet Oil and the Juice of Plantain; and keep them in the Stable for a Week or more, and I hope you will not fail of a Cure.

49. *For the Pole-Evil, or a Fiſtula.*

The Pole-Evil is an Impoſthume which ariſes on the Pole, and for the moſt part is cauſed by a Blow or a Pinch, or the fretting of a new Halter or Collar, and at firſt it requires no other Method of Cure than what is common to other Biles and inflamed Tumours, by ripening and bringing it to Matter; but when it is of an old ſtanding, then it oftentimes turns to an Ulcer for want of Care, or a right Judgment. There is a ſmall Sinew under the Knowl-bone, where the Matter is apt to lodge, unleſs Care be taken, and when it is ripe and ready to break, you muſt open it with a Lancet, or Knife, for when it is open, you may come at it the better, and when you burn it with your Iron you muſt put in a Tent; but I think Tents are not ſo proper for any Wounds, if it can be any way helped; for when they tent any Wound, it is all Gueſs-work, you may be wrong as well as right.

But it is my Opinion, that it is the beſt way to lay them open, the better to come at the Bottom of the Wound; then cleanſe the Ulcer with any cauſtick Remedies, or Spirits of Wine, or Brandy, or Spirits of Camphire, or Mutton-ſuet melted, or Vitriol, or Mercury, or Arſenick, or any thing that's proper to eat away the proud Fleſh; and when you have got to the Bottom, and quite cleanſed it, then you may heal up the Wound with any greaſy Ointments, as before mentioned concerning Wounds and Ulcers.

A Fiſtula is a Thing that comes by a Pinch of a Saddle upon the Pitch of the Shoulder, and you muſt go on as before mentioned; you muſt bathe the Swelling firſt, and ſink it if you can, and when you have brought it to a Head, go on as before, and I don't doubt, but with Care you will find all theſe Things will anſwer your End, for the Cures concerning Wounds and Fiſtula's, Pole-Evils and Ulcers.

50. *For Navel Galls.*

A Navel Gall is ſeated upon the Top of the Back, oppoſite to the Navel, and it is cauſed by a bad Saddle, which being neglected, turns to a foul, fungous and a Fiſtula-Ulcer, and ſometimes it looks like a hard dented brown Jelly, and ſometimes black and mortified, and ſometimes white, and Moiſture in the Part.——An Ointment may be made of Quick-ſilver and Turpentine, one Ounce of Quickſilver to every two Ounces of Turpentine, rub them in a Mortar 'till they be well incorporated, and then ſpread upon Hurds or Flax, and laid ſmooth on each Side of the Spine over the Swelling, and dry Pledgits of Hurds or Bolſters to keep it on, and then girt him round with a Circingle. But if the Sore be dead, and full of proud Fleſh, you muſt cut it to the Quick with a ſharp Knife or Razor, and then let it be dreſſed according to the Directions given in the Cure of Wounds.

A Sitfaſt alſo proceeds from a Saddle-Gall, and when it is dry and horny, it may be cured by anointing it firſt with Oil of Bays until it turns ſoft, and then by dreſſing it with Quickſilver and Turpentine, as before directed, which alone will make a Cure, when you have got all the horny Subſtance off from the Wounds. I think I have given you ſufficient Directions concerning Navel Galls or Sitfaſts, ſo that any Smith or Farrier may make a Cure, if he knows any thing of a Horſe at all.

51. *For a Wrench in the Shoulder, or a Shoulder-Splint.*

To underſtand the Nature of theſe Infirmities, that is, to remember that the Blade-bone of the Shoulder is fixed to the Body, not by Articulation or Jointing, but by Appoſition, being laid to the Ribs, and faſtened by the Muſcles, which lie under and above it; ſo when a Horſe happens to receive a Blow, or a Strain in the Shoulder, the Tendons of thoſe Muſcles are ſtretched and relaxed, and when that is violent, it is called a Shoulder-ſplint, and becomes more or leſs dangerous, according as the Horſe is for Hardineſs. And this Accident happens to him ſometimes by a falſe Step, or a Blow, or hard Riding; and to find out where the Diſtemper lies, you muſt try him by ſhoeing him and ſearching him from his Shoulder to the Bottom of his Foot, and you muſt preſs your Hand hard againſt his Shoulder; and if he be hurt there, he will flinch when you touch the wounded Part, and will draw his Legs with a Circuit like a Half-Moon, and ſo you muſt go down to his Knee, and if you find it there, his Knee will be ſwelled, and burn with Heat like a Fire, and will not bend it.—And from thence go down to his Paſtern Joints, and if he be ſtrained in the Sinews, they will puff out and ſwell like a Bladder. And ſometimes it is in the Joint, then he will go on his two Legs. But when it is in the Foot, you will ſoon find it out, by ſetting it to the Ground, and when he treads upon the Ground, he will favour himſelf, and take his Foot up again, and when he does that, you may well know where his Ailment is. I hope I have given you ſuch Directions, as that you may eaſily find out the Cauſe; and now to proceed to the Cure.

If it be in the Shoulder, take Oil of Turpentine, and the Oil of Worms, and Brandy, and camphorated Spirits, and Spirits of Wine, of each an Ounce, and burn him with a hot Iron. Take of the Soldier's Ointment, or Nerve Ointment, half a Pound, Ointment of Marſh-mallows ſix Ounces, Oil of Amber four Ounces; mix them all together, and with a hot Iron-Bar chafe the Part twice a Day.

The Soldier's Ointment is made as follows. Take freſh Bay-leaves half a Pound, of Rue five Ounces, of Marjoram four Ounces, two Ounces of Mint, of Sage, Wormwood, Comfrey, and Baſil, of each an Ounce, Oil Olive three Pounds four Ounces, of yellow Wax eight Ounces, of *Malaga* Wine four Ounces; bruiſe all theſe together, and boil them to the Conſiſtence of an Ointment, ſo keep it cloſe; or the Ointment of *Montpellier*, which is made as follows:

Take of Ointment of Roſes, Marſh-mallows, Populeon and Honey, of each one Ounce; as likewiſe of the Oil of Turpentine, Earth-worms, and Oil of Petre; Nerve Oil, Bear's Greaſe, Hog's Greaſe, Mule's Greaſe, Deer's Suet, and Badger's Greaſe, the ſame Quantity of each, ſo melt them together: All theſe Oils are very proper for any Strains or Bruiſes as before-mentioned. But if a Shoulder be ſplit, which may happen by a Blow, or a Kick of another Horſe, and theſe Oils or Ointments may not anſwer the End, which will be ſeen in two or three Days, you may be aſſured there is ſome great Accident, and you muſt fire him round the Plate-bone, making a Circle the Breadth of a Trencher; but be ſure to let the Joint be in the middle within the Circle, and pierce the Skin with a ſmall hot Iron, leaving about an Inch between the Holes; and to each Hole apply yellow Wax and Roſin, melted together, until the Scars fall out, and then dreſs with Turpentine and Honey, applying Plaiſters, as directed, until the Sores be dried up, which are made as follows:

Take common Pitch half a Pound, Deminio Plaiſter, or Diachylon, of either ſix Ounces, of common Turpentine four Ounces, of Oil Olive two Ounces; melt them together in a Pipkin over hot Embers, continuing ſtirring; and when theſe are diſſolved, add Bole Armoniack, in fine Powder, four Ounces; Myrrh and Aloes, of each an Ounce; ſpread this on the Horſe's Shoulder before it grows cold, and put fine Flokes, of the Colour of the Horſe, all over it; for a Shoulder-Pitch is cauſed by a Fall, *&c.* which will be ſeen by a Swelling on the Pitch of the Shoulders. The beſt way is to bleed him in the Plate-Vein, and put a Rowel in his Cheſt, and you may bathe him with the afore-mentioned Oils; and when the Rowels begin to run, give him moderate Exerciſe every Day, and that will carry it off, unleſs he be very much bruiſed; and if ſo, you muſt bathe him with the Fermentation before-mentioned concerning Wounds; which, if he don't take Cold, will anſwer the End.

52. *For Swayed Backs, and Strains of the Hips.*

A Swaying of the Back is a Pain and Weakneſs in the Reins, cauſed by a Fall, or the carrying of ſome heavy Burden, and the Horſe is hurt very much inwardly, which brings him into the greateſt Diſorder imaginable. There is no ſuch thing as to break a Horſe's Back but by an Accident, as a Fall, or carrying ſome heavy Burden, and then you ſtrain the Sinews and the Muſcles of the Back; and to begin the Cure, the firſt thing is, to take a plentiful deal of Blood from the Neck, after that a cold Charge, which is Vinegar, Bole Armoniack, and the Whites of Eggs; Verjuice may be uſed inſtead of Vinegar, and you may give him ſweet Oil a quarter of a Pint in a Day, for two or three Days together; and if the Horſe be not poor, you may bleed him behind in the Thigh Veins, and you may give him Brimſtone and Powder of Liquorice, and Honey, with ſome ſweet Oil, made into Balls; give him one at Night, and one in the Morning; and you muſt give him a good deal of Reſt, and if it be in the Spring of the Year, turn him out to Graſs, and if he be a young Horſe, he will do well the ſooner, for Reſt is the chief Article of the Cure.

But if it be a Mare, ſhe will do well the ſooner, for ſhe will throw out the Clods of Blood from her Body, and if they be weak, you may girt them round with a Circingle, and you may put a Sheep's-ſkin on the Back, and that will be of great Service to them.—The Strains of the Hips are to be accounted for, in the ſame Manner as thoſe of the

Shoulders, and if the Thigh-bone be thruſt out of its Sockets by the Violence of the Accident, then it is ſaid to be Hip-ſhot, and if it is not reduced immediately, he will be irrecoverably lame. The Cure conſiſts in the ſame Applications that are proper for a Shoulder-ſplint.

53. *For Hurts in the Stifles.*

This kind of Accident comes by a Strain, or a Blow on the Stifle Bone, which is the Knee-pan of a Horſe; when the Ligaments which cover that Bone are ſo much relaxed, that it becomes looſe, moving upwards and downwards, and ſideways by the Touch of your Hand, and the Horſe going down-right lame, he is ſaid to be ſtifled; but it is a great Miſtake in ſome People, to think the Bone is out of Joint, for there is no ſuch thing can be, except thoſe Ligaments are cut aſunder; for when the Horſe has a Blow on thoſe Ligaments, then he goes very lame, and he is ſaid to be ſtifled. And now I will proceed to the Cure.

Firſt, anoint him with Marſh-mallows, or Oil of Turpentine, doing it in with a hot Iron, and you may numb his other Leg with the Web of a Girt, and in two or three Days you may lay on the Plaiſter, which muſt be made of Pitch, Myrrh, Olibanum, and Dragon's Blood; the Pitch muſt be melted with a little Oil, or Hog's Lard, and the other Ingredients made into Powder, and ſtirred into it while it is warm, and after that it may be poured upon the ſtifling Place, covering it with Flokes, or the Stuffing of an old Saddle, and you may put him to Graſs an Hour or two in the Day, and give him moderate Exerciſe, until he is fit for more hard Labour.

54. *For the Bone-Spavin.*

This is a hard bony Subſtance that grows on the Inſide of the Hoof, not far from the Elbow, and is generated of the Matter which nouriſhes the Bones and Ligaments. Some Horſes are foaled with this Imperfection, but for the moſt part it proceeds from a Strain, while a Horſe is too young to bear violent Fatigue, which in Proceſs of Time cauſes Lameneſs. The main Intention in the Cure, is to remove the Excreſcence, for it lies as an Appendage; in which Caſe it may be removed by a dexterous Application of the Fire, or by the Uſe of cauſtick Ointments; for theſe, by bringing a Flux of Matter, and a conſtant Moiſture into the Part, will by degrees looſen that hard Subſtance, ſo that it may be eaſily taken off; and for this Purpoſe I recommend to you the following Ingredients:

Take Quickſilver and Brimſtone, of each two Ounces, rub them in a Mortar until they turn to a black Powder; then take *Spaniſh* Flies, and Euphorbium in Powder, of each ſix Drams, corroſive Sublimate two Drams, Apoſtle's Ointment four Ounces; mix them cold in a Mortar, or on a Marble. The Method of applying this Ointment is, firſt, rub the Part with a Piece of any round ſmooth Stick, then lay over a ſticking Plaiſter to guard the reſt of the Hoof; this muſt be made of Roſin, common Pitch, *Burgundy* Pitch, ſpread on a thick Piece of Leather, having a Hole cut in the Middle that the Tumour may come through it, upon which the Ointment is to be applied, the Hair being alſo ſhaved away, over which muſt be laid a Pledgit of clean Hurds, faſtened with an eaſy Bandage round the Hoof, or another ſticking Plaiſter over.

This Ointment will at firſt draw out a thin Water, but after two or three Days Application it will form a Scar, which may be ſcarrified with a Flem or Lancet, continuing the Application every other Day, until the Bone becomes looſe, or its Subſtance diſſolves; and after it is removed, the Ulcer muſt be dreſſed with Honey of Roſes, and Tincture of Myrrh warm.

55. *For the Blood Spavin.*

This Diſtemper comes by a Swelling of the Maſter-vein on the Inſide of the Hoof, and is juſtly compared by *Solleyſell* to an *Avarix* in Men, and the Cure is performed by taking up that Part of the Vein which forms the Tumour, and healing the Wound by binding the Hoof at top and below with a ſtrong Bandage, and then tie the Vein with a Bit of Silk at both Ends before you cut the Vein in two, becauſe the great Quantity of Blood that will come therefrom, will make it very troubleſome to tie the Vein when it is cut; when this is done, heal up the Wound with Honey and Turpentine, and a little Tar, and waſh the Wound with Brandy, or Spirits of Wine.

Some Farriers only prick the Vein with a Flem or a Lancet, and tie a ſtrong Bandage over the Orifice, and ſo apply a cold Charge all round the Joint, made with Whites of Eggs, Bole Armoniack, and Vinegar; but it is not a certain Cure, for the Way is to take up the Vein (as I ſaid before) and a cold Charge is very proper in this Caſe if the Vein be took up, becauſe it will ſtrengthen the Joint after you have healed up the Wound.

56. *For Mallenders and Sellenders.*

The Mallenders are Chops or Chinks on the bending of the Knee, which diſcharge a ſharp undigeſted Matter cauſing Pain, and making the Horſe go lame before. And the Sellenders, which appear on the bending of the Hoof, make him go lame behind; both which proceed from one and the ſame Cauſe, and are ſometimes accompained with a Scab, and a conſtant ſtaring and briſtling of the Hair.

The propereſt Method for the Cure is, firſt waſh them with a Lather of Black Soap warm, or old Chamber-lye, after which, apply a Poultice of the Roots of Marſh-mallows and Linſeeds, ſoftened with Linſeed-oil; and as often as it is applied, you may mix half an Ounce of Camphire in Powder, tying it on with a Roller; this may be continued till the Scabs fall off, and the Sores grow clean; then take Turpentine and Quickſilver, of each equal Parts, ſtirring them in a Mortar till they be well incorporated, ſpread a Pledgit with the Ointment, and apply it to the Sore, laying it on as above directed, and renew the Dreſſing every Day until the Cure is perfected, obſerving conſtantly to waſh all the Chinks with Brandy, or Spirits of Wine.

You may put on a little Oil of Vitriol, and a little Juice of Elder, and anoint them with a Feather once a Day, for two or three Days together when they come firſt, and when the Scabs fall off, anoint with Hog's Lard and Soot, which will make the Hair come again; or a Turd is very good when they come firſt.

57. *For the Hock Bone.*

This is a hard Tumour that grows on the Elbow of the Hock, and is a Sinew-like Matter which covers that Bone; it proceeds from a Strain or a Blow, and when it happens to be of long Continuance, it becomes difficult and hard to be cured, the Subſtance of the Swelling being like hardened Glue—In the Beginning take Soldier's Ointment, Ointment of Marſh-Mallows, and Oil of Amber, as directed in Page 361. No. 51. againſt *Strains in the Shoulders,* and rub it into the Part with a hot Bar of Iron, holding it cloſe, and taking care to fetter the Horſe ſo, as he cannot ſtrike.

If it does not yield to this Remedy, take a ſufficient Quantity of a Diachylon with the Gums, which may be had at an Apothecary's; melt it in a Pipkin, and pour it warm upon the Top of the Hoof, renewing it as often as it begins to waſte; if the Swelling increaſes, and turns to an Impoſthume, it may be ripened with a Poultice, and opened with a hot Iron, piercing from below upwards, and dreſſed with the common Ointment, *viz.* Turpentine and Honey, or the Yolks of Eggs, with a Mixture of Spirits of Wine, making a firm Bandage over the Part, and by this Means it may be cured. But if the Hardneſs ſhould happen to continue, and cannot be brought to a Head, then proceed to the Fire. Firſt, make a little Way into the Body of the Tumour with a round Iron, and drawing from thence ſeveral ſuperficial Lines, which may be dreſſed according to the Method already laid down for performing that Operation.

58. *For a Splint or Splints.*

A *Splint* is a callous hard Subſtance that adheres to the Inſide of the Shank-bone; when there is but one, it is called a *Single-Splint*, but when there is another oppoſite to it, on the Out-ſide of the Shank-bone, it is called a *Peged*, or *Pined Splint*; they proceed from a Strain, or by being preſſed with ſome extraordinary Weight towards the Shoulders, before thoſe Bones are firmly cemented and put together, eſpecially when he goes down-hill with a heavy Burthen on his Back, it bears ſo hard upon his Fore-legs, which cauſes thoſe little Bones which ſupport the Knee to bend; and although the Horſe does not grow immediately lame upon it, yet it brings a glutinous Matter which ouzes from between the Bones on the Inſide of the Shank, and it is like the Gum which iſſues from a wounded Tree, and is thus formed into a Splint: But when it is violent, or the Horſe be of a tender delicate Make, the Influx of Matter will be the greater, ſo that it ouzes through the oppoſite Side alſo, and forms a *Peged*, or *thorough Splint*, which looks as if a Wedge was ſtruck quite through the Bone.

Moſt of theſe Swellings make their firſt Appearance a pretty way below the Knee, in the Cleft between the Bones in the wideſt Part, which is very natural; they not only aſcend to the Knee, but go a good way down the Shank, but ſometimes backwards towards the Maſter-ſinew ; there are little hard Subſtances that ariſe among the ſmall Bones of the Knee, on the Inſide ; they grow out of the gummy Subſtance that faſtens thoſe Bones together, one on the Outſide, and the other on the Inſide, and that is what are called *Splints* ; but when there is but one, it is then called a *ſingle Splint*. And when it is of a long Continuance, it turns to a hard Subſtance like a Spavin, or the Bone itſelf.— And to deſtroy this hard Subſtance, the Cure is this ; If the Horſe be young, and the Splint tender, you may rub it with a Stick, and after you have bruiſed it till it is turned ſoft, ſtrike your Flem or Lancet into it, but be ſure you don't cut too deep, for fear of cutting the Sinews.

Then ſhaving the Hair away, anoint it with the Ointment before-mentioned ; then lay on a Bliſtering Plaiſter to draw out that gummy Subſtance ; but if it is become a hard Subſtance, you muſt knock and rub it to ſoften the Splint ; then take a Piece of the Rind of Bacon, not very fat, and lay the fat Side outwards ; afterwards apply a flat Cautery, or a red-hot Iron, about the Bigneſs of a Shilling, holding it upon his Skin ; in the mean time, order another Iron to be heated, which muſt be applied after the ſame manner, till the Swelling be ſunk.

Then lay a Plaiſter over it, and the Shavings of Cloth upon that ; take care that the Horſe do not bite it off. But if the Horſe is growing old, and the Splint is become a bony Subſtance, and is very faſt to the Bone, then it is very hard to be cured ; but if the Horſe be young, and the Splints be only a gummy Subſtance, then you may make a Cure.

59. *For a Sinew-ſprain.*

A *Sinew-ſprain* comes by a ſudden Accident, and 'tis very common among Horſes, ſo that no Man can be a Stranger to it that keeps Horſes, for the Sinew will ſwell, and the Horſe will be lame, and in that Part there will be a great Heat and Swelling.—Then bleed him in the Neck, and bathe all his Legs two or three times a Day, with Woollen Cloths wrung out of a Fomentation made of Mint, Rue, Penniroyal, Marjoram, Baum, Roſemary, Lavender and ſuch like Things, to comfort the Nerves ; after that you may uſe Spirits of Wine, keeping it alſo covered with a Cloth dipt in the ſame, and faſtened with any Bandage till the Anguiſh is over; then lay on a good ſtrengthening Charge, or Plaiſter of *Burgundy* Pitch, Diachylon, Dragon's-blood, and Bole Armoniack; and if the Horſe is galled or wounded, take Tar, Turpentine, and Honey, to heal up the Sore.

60. *To make green Oil, or Oil of Charity.*

Take the Tops of young Bays, Red Sage, Lavender Tops, and Roſemary, of each a Handful, Camomile a Handful and a half, ſhred them very fine, and pound them in a Mortar; then put a Quart of the beſt Sallad-Oil to them, then put all of them into a new glaz'd Pipkin, cover it cloſe, and ſet it on a gentle Fire, that it may not boil, but only ſimmer. The Lid of the Pipkin muſt have a Hole in the Top for the Vapour to evaporate; keep it an Hour and half, then ſtrain it through a clean Cloth, into a clean Bottle, and when it is cold, put in an Ounce of the Oil of Spike. It is only to be made in *May*, and is very good for a Burn or Strain, or any old or new Wound, or Pains in the Body, warm or cold.

61 *For a Ring-Bone.*

This is a hard callous Subſtance, that grows in the hollow Circle of the little Paſtern above the Cronet, and is frequently occaſioned by a Strain, and is bred of the like Matter with the other hard Subſtances before-mentioned concerning *Splints*, and breaks out upon the Top of his Foot, and goes quite round like a Ring; from that it has obtained the Name of a *Ring-bone*.

The uſual Method of taking it off, is by applying ſtrong cauſtic Medicines, ſuch as Quickſilver, Arſenick, Realgar, and the like. The Hair being firſt ſhaved, and the hard Subſtance ſcarrified, ſome uſe unſlacked Lime in Powder, and apply it pretty thick over the Part, faſtening it with a Cloth, and then ride the Horſe into the Water, letting him ſtand ſome time in it, by which Means the Ring-bone is deſtroyed. But whoever tries it, had need be very careful to guard the Cronet, or elſe it will be apt to cauſe a Gathering of Matter under the Hoof, which would readily corrode the Coffin-bone.

There are others who cut the Ring-bone ſtrait downwards to the Cronet in ſeveral Places, and put in Rowels, which by forming Ulcers, and bringing a Rottenneſs and Corruption all about the Part, looſens and melts it away. But ſome Ring-bones cannot be removed without the Fire, and the Soles taken out, and the Fruſh laid open; for by this there is a very great Moiſture derived into the Part, and at the ſame Time, Room is given for the Matter to diſcharge itſelf; but if the Horſe be old, and the Ring-bone of a long Standing, it will be a hard Thing to cure him.

62. *For Wind-Galls.*

Wind-Galls are ſoft Tumours ſeated on either Side of the Footlock Joint; they are cauſed by violent Straining, or any Blows by another Horſe; and the Cure is performed by opening them with a Flem to let out the gummy Matter, and applying to the Orifice a little Plaiſter of Roſin, Pitch, Maſtick, Oil of Bays, with the White of an Egg, and the Ointment made of equal Parts; Oil of Turpentine and Quickſilver will anſwer the End much better——But the hollow Space on each Side of the Sinew muſt be filled with Hurds moiſtened in warm Spirits of Wine, and a good Bandage applied over all the Fetlock, to prevent their growing again; or the following Charge may be apply'd—Take two Ounces of Galbanum pounded, boil it gently in a Pint of Vinegar over hot Embers, with half a Pound of common Turpentine, and after half an Hour's boiling take it off the Fire, and add to it Maſtick, Myrrh, Dragon's-Blood, and Bole-armoniack, of each three Ounces; mix theſe and make a Charge, which muſt be applied hot to his Legs, and if the Horſe be not old, nor much ſtrained, theſe Remedies will not fail of a Cure.

63. *For the Greaſe falling into the Legs.*

This Diſtemper is a Swelling and a Gourdineſs of the Legs, which frequently happening to Horſes after a Journey, moſt People have therefore believed their Greaſe to be melted with hard Riding, and ſo falls into their Legs; but the Greaſe is frequently known by moſt Men that keep Horſes; and this Diſtemper happens by bad Feeding, or long-ſtanding in a Stable, for want of Exerciſe, or by hard Labour; for when you feed your Horſe well, and make him luſty, then if you work him hard, and let him ſtand ſtill in the Stable, that is the Cauſe of his Legs ſwelling all round the Joint, and his Legs will drop like a Leach, and then they ſay his Greaſe is melted, becauſe he looks thin and won't eat his Meat; but that is not the Thing, for he is in great Pain, and will not eat his Meat by reaſon of the Anguiſh he is in; for when a Horſe's Greaſe is melted, he will never be fit for any more Buſineſs, for then it is ſaid that his Heart is broke.—For take all the Pains you can, it's all in vain, for he'll waſte away like a Conſumptive Man, and die as rotten as a Pear; and ſome of theſe Humours happen to be Heart-ſwoonings; and his Legs are hot and dry, and break out in the Footlock with Cracks and Chops. Now I will proceed to the Cure.

If your Horſe has been well fed, and of good Plight, then you muſt bleed and purge him two or three times in a Fortnight's Time; then you may rowel him in the Belly, or in the Inſide of the Thigh, and you may bathe his Legs with any Beef-broth or Pork-broth, or any greaſy Liquor, for two or three Days.

Then take of Honey one Pound, Turpentine ſix Ounces, incorporate them with a Spoon; then take Fenugreek and Linſeed Meal, of each four Ounces, Bay-berries and Juniper-berries dried and made into Powder, of each two Ounces; boil them in three Quarts of Red Wine Lees to the Thickneſs of a Poultice, and when you take it off the Fire, add two Ounces of Camphire in Powder, ſpread it on Cloths, and apply it warm to the Legs, faſtening all with a ſtrong Rowler: This may be continued for a Week, renewing it once in two Days.—The camphorated Spirits of Wine are very good alone, and you may make an Ointment of Hog's Lard, Turpentine, burnt Allom, and Verdigreaſe; make it ſo that you may anoint it with your Finger and not melt, but when you make it, make it all together; this is a very good Ointment to heal his Legs when the Humour is turned.

64. *For Warts, Rats-tails on the Legs and Paſterns.*

Theſe are all of the ſame Kind, and are more or leſs dangerous, as they are nearer, or at a Diſtance from the large Sinews.

Warts may be waſted by touching them now and then with Aqua-fortis, or they may be cut off when they are ſuperficial; but the Scratches are for the moſt Part bred of a tendinous Subſtance, and have their Roots in or near the Tendons, like the Corns in Mens Feet: Sometimes they grow ſo hard, that by preſſing upon the ſofter Parts, they cauſe violent Pain; but when this happens, a good Poultiſe ſhould be applied to ripen the Inflammation, unleſs the Matter ſpring naturally from the Roots of it, which will looſen them ſo as they may be eaſily removed by the Uſe of Medicines that are but moderately corroſive; therefore to proceed, whenever you obſerve a Moiſture and Rottenneſs, you need only apply a Lump of Rye Leaven, mixed with Vinegar and the Juice of Garlick, or Muſtard-ſeed pounded; and with two or three times Application it will bring out the Rottenneſs.

Or you may uſe the following Poultice, which is made of Hog's Lard and Cow-dung, or Brann, or Milk and Bread; or this:

Take Hog's Greaſe, Soap, Brimſtone, and Honey, boil them into a Poultice with a ſufficient Quantity of Soot, and to every four Ounces add half an Ounce of the Powder of Verdigreaſe, and if your Horſe's Legs have Holes in them you may properly call it an Ulcer; then ſearch with your Probe which Way they go, then with your Knife cut them into one another, then clean the Wound, and you may heal it up with the Ointment mentioned in N°. 40.

65. *For a Quitter-Bone.*

A Quitter-bone is an Impoſthume which breeds between the Hoof and the Coffin-bone, on the upper Part, and makes its firſt Appearance by a Swelling on the Cronet, and proceeds from a Blow or Strain, or over-reaching himſelf, and ſometimes it comes by a long continued Swelling of the Legs and Paſterns.

Now if this Ulcer be not of a very long Standing, it may be cured by the Application of Egyptiacum mix'd with Baſilicon or Turpentine; but if it be of a long Standing, then you muſt open the Ulcer, and ſearch to the Bottom of the Wound, and if the Muſcles that paſs between the Hoof be rotted, you muſt in that Caſe open the Tumour with a ſharp Razor, or ſome other ſharp Inſtrument, cutting away all that is corrupted and rotten, either from the Hoof, or any other Part of the Foot. And to make a Way for the Operation, you ought to raſp down ſome Part of his Hoof; if any Bits remain, you may apply ſome Vitriol, Arſenick, or Marake; and when you have got it all out clean, then heal up the Wound with Honey and Turpentine, and Tar, and waſh the Wound with Spirits of Wine or Brandy, and when it is clean, heal it up with ſome Things before mentioned,

tioned, waſhing it now and then with Copperas or Vitriol-water.

66. *For Foundering in the Feet.*

This is an exceſſive Pain in the Feet, whereby the Horſe being ſcarcely able to touch the Ground, draws himſelf in a Heap; and it comes by hard Riding, or Shoeing, and being put into a cold Stable when he is very hot, and that falls into his Feet, then he is ſaid to be founder'd.

The Cure is this; Draw out the Sole, and raiſe the Hoof in two or three Places, and keep the Foot open as wide as you can. Then take Tar, Turpentine and Honey, melted together, with a fourth Part of Spirits of Wine, ſoaking Hurds in this Mixture, laying them on for two or three Days after the firſt Dreſſing, continuing afterwards to make your Applications every Day until the vacant Spaces of the Hoof be filled up. The ſame Application ought to be made to the Sole, covering the whole Foot with Flaxen Cloths dipt in Oil and Vinegar beat together, which may be faſtened with a Rowler, or a pretty long Piece of Liſt, and you may melt Pitch and Tar, with a ſufficient Quantity of Hog's Lard, pouring in the Mixture boiling hot upon the Sole; but you muſt pare the Sole very thin, ſtuffing it up very carefully with Hurds of Tow or Flax: And this is very proper for a Horſe that is hot-footed.

67. *For a Prick in the Foot.*

A Prick in the Foot is very bad, and nothing cauſes more Pain, nor is more troubleſome than that Accident, which happens to the Feet by bad Shoeing; or when ſharp Splints or Stubs are ſtruck in the tender Parts within the Sole, and the Inſide of the Foot is very tender and troubleſome, in caſe it be of a long ſtanding, becauſe it is ſome Time before you can find it out; and ſometimes it is neglected by thoſe who look after them; and when you draw out the Nail, be ſure you leave none behind if you can help it, becauſe that will feſter and become an Ulcer; but if you can draw the Nail all out, then pour in a little Oil of Turpentine, or Spirits of Wine into the Orifice, and a little melted Wax for ſome Days, and taking care not to ride him into Water; and if you happen to leave a Bit of the Nail in, you muſt lay the Hole open, and pick it out, or you may draw it out with Turpentine. But if after all you find a continued Lameneſs, and the Matter that come from the Sore is thin and bloody, or yellow, viſcid and ſtinking, you may then reaſonably believe there is an Ulcer formed either in the Bone, or among the Sinews: In this Caſe it will be proper to take up the Sole, and with a Razor or Flem make Inciſions 'till you have got a full View of the Bottom of the Sore, taking Care not to wound the large Sinews, if poſſible, unleſs they be mortified and rotten. You need only apply dry Lint to the Part, or Lint dipt in Spirits of Turpentine, for the firſt Dreſſing, which need not be removed for two or three Days; in which Time the Wound will be digeſted, and the Blood turned to Matter. And if the Coffin-bone be foul, you may ſcale it by the Application of ſome cauſtick Medicine, as the Powder of Sublimate mixed with Honey; but the beſt Way is to ſear it with a hot Iron, and when the Scales are fallen off, you need only dreſs it with Pledgits dipt in Tincture of Myrrh and Aloes, until the Bone be covered, and over the ſame you may lay Turpentine and Honey, and Spirits of Wine; and if any proud Fleſh put forth, you may dreſs it with the preſcribed Remedies in the Cure of Ulcers; and over the ſame lay a Charge made of Vinegar, Bole, and the Whites of Eggs, all over his Foot and Paſterns, to lay the Heat and Inflammation; and feed your Horſe with opening Diet, and moderate Exerciſe.

67. *For the running Fruſh.*

This Diſtemper is known by the Eye and Smell, and it is like old rotten Cheeſe: It is not dangerous, but very troubleſome, becauſe it cauſes a continual Itching: In order to the Cure, you muſt pare the Foot with your Buttreſs as near as you can, then waſh the Part with Lime-water, or Allom-water boiling hot, then apply a Charge made of Soot, Vinegar, and the Whites of Eggs, and waſh the Part ſometimes with Vitriol-water; and when you perceive the Itching gone off (for the running Fruſh comes by an Itching) you may pour melted Tar all over the Frog, and keep the Foot clean from Dirt and Filth; and when it is clean, ſtop the Foot well with Cow-dung and Hog's Lard, and that will keep the Dirt and Filth out of his Foot.

68. *Of the Crown-ſcab.*

The *Crown-ſcab* proceeds from a ſharp Matter ouzing through the Skin above the Cronet, which frets off the Hair, and hardens into a white mealy Scab. In ſome Horſes it is accompanied with a Moiſture, and ſends forth a ſtinking Matter. The Cure is, firſt, ſcrape off the Scales gently, and afterwards waſh the Sores with Copperas or Vitriol-water; ſome make uſe of Sprirts of Wine wherein Tobacco has been infuſed, which oftentimes takes Effect; or you may take Roſin half a Pound, Pitch ſix Ounces, Turpentine four Ounces, Verdigreaſe and Brimſtone in fine Powder, of each three Ounces; melt the Pitch, Roſin, and Turpentine, over a gentle Fire, and then ſtir in your Powders; if it be too hard, you may ſoften it by adding to it a little more Turpentine; and if you incorporate a ſmall Quantity of Quickſilver with it, it will be the better. This muſt be ſpread on Leather, and applied to the Part, firſt ſhaving away the Hair, letting it lie ſo long as it will ſtick; and if the Scabs come off, and it has done running, you may heal up the Sore by the Directions laid down for the Cure of Ulcers.

69. *Directions concerning a Brittle Hoof, or a Soft Hoof, or Narrow Heels, or a Falſe Quarter.*

A brittle Hoof is cauſed by ſtanding in hot Litter, and long ſtanding in a Stable without Exerciſe, which by that Means cauſes a great Heat to his Feet, and to prevent this, keep your Stable clean; and if he ſtand ſtill in the Stable, give him moderate Exerciſe, and then you will ſoon find your Horſe's Feet in good Order, if he be in good Health; you may greaſe his Feet now and then with any freſh Greaſe, and then you will find his Hoofs to be black, and as tough as Wire.

The next is a ſoft Hoof, and that is cauſed by a Humour that proceeds from a running at his Heels, which proceeds from Heats and Colds; it is not a natural Softneſs, but proceeds from that ſharp Humour; and to prevent this, you muſt purge him, and rowel him in the Belly, and waſh his Legs with Vitriol-Water, or Lime-Water, or Copperas-Water; and when you have turned the Humour, and made his Legs perfectly ſound, then perhaps you may find his Hoofs too brittle; but if they be, you muſt anoint them as before, and keep his Feet well ſtuffed, which will be of great Service to him.

The next thing is a narrow Heel, which comes by bad Shoeing; it is what you may call too near, and draws the two Corners of the Hoof, and preſſes upon the Sole, and makes the Horſe go lame; now to give him Eaſe, you muſt pare his Foot, and open both Corners, and then ſhoe him with half-moon Shoes, or Pantofle Shoes, and they will preſs out the Corners and keep them out; and you may greaſe the Hoof now and then with Hog's Lard, or any Ointments that are greaſy, and ſhoe him wide.——A falſe Quarter is a Reft or Chink in the Quarter of the Hoof from top to bottom; it happens generally on the Inſide, that being the weakeſt Part of the Hoof, and proceeds from the Drineſs of the Hoof, when a Horſe is ridden in dry, ſandy, or ſtony Ground in hot Weather, or in froſty Weather, and alſo by bad Shoeing; then this Accident is both painful and dangerous, for as often as a Horſe ſets his Foot on the Ground, the Chink widens; and when he lifts it up, the ſharp Edges of the divided Hoof wound the tender Fleſh that covers the Coffin-bone. The uſual Method taken to remedy this Imperfection, is, by cutting off that Part of the Shoe which lies upon the Chink, that it may be wholly uncovered; then with a Drawing-Iron open the Reft to the Quick, filling it up in all Parts with a Rowel of Hurds dipt in Turpentine, Wax, and Sheep's Suet, melted together, renewing it every Day until the Seam be filled up very well; and after that, Care muſt be taken to keep the Hoof moiſt with Applications of Tar, Honey and Greaſe. Some pour in Aqua-fortis into the Reft when the Pain is violent; but if you make uſe of this, be ſure to make a Border on each Side with Wax, for fear of ſpoiling the reſt of the Hoof; then dreſs his Foot with Tar and Honey, Turpentine and Hog's Lard, or any greaſy Ointments, and tie his Foot with Liſt to keep it from gargading, and always keep his Foot moiſt; give him opening Things for his Diet.

70. *For Caſting the Hoof.*

The Loſs of the Hoof is occaſioned by Pricks and Stubs, or Foundering, or riding into cold Water when the Horſe is hot; and if the Foot has got any Damage, it will be a thing impoſſible to procure a new Foot; but if the Foot be ſound, a new Hoof may be procured with care; when you find your Horſe's Hoof looſe, and crack'd upon the Top of it, then you may apply to the Coffin-joint Tar, Turpentine, Oil, Pitch, and ſuch like things melted together; then make a Boot of Leather, with a ſtrong Sole, to be laced faſt about the Paſterns, bolſtering and ſtopping the Foot with fine Flax, that the Tread may be eaſy, renewing the Dreſſing every

Day until the new Hoof grow; (the Boot is certainly very proper) the Ointment will not always be ſufficient, ſo I recommend to you the following.

Take of Roſin half a pound, Oil-olive a Pound, diſſolve the Roſin in the Oil over a gentle Fire, and when it is diſſolved, take it off; and when it begins to cool put in Myrrh, Aloes, Maſtick, and Olibanum in fine Powder, of each two Ounces; make it into an Ointment, and having made an eaſy Bandage over it, return it into the Boot; if the Ointment requires more Powder, you may add the Powder of White Vitriol, or burnt Allom to a Pound of Ointment, with half an Ounce of Orpiment, whereby the Hoof may be preſerved ſmooth, being dreſſed once a Day in the manner directed. It is the way of ſome Farriers, when they perceive the new Hoof growing before the old one falls off, to pull away the old one; but they ought not to be too haſty, for the old one ſerves as a Cover for the new one; and if the Horſe be young, you may turn him to Graſs, for that will keep his Foot cool, and by this means he may come to have a very good Foot again, and do good Service. I knew a Horſe which had all his four Hoofs came off, and came again, and the Horſe did a great deal of good Service after that the new ones were come again.

71. *Receipts for Ointments.*

Now for all freſh Wounds, and them that are clear, greaſy Ointments are beſt, ſuch as be made of Hog's Lard, Honey, Turpentine, Roſin and Pitch, or Marſh-mallows; ſometimes you may put in a little burnt Allom, or Verdigreaſe, or Soot is very good, and you muſt make it ſo as it will keep the Wound clean, and make it as you think proper, more of one ſort than another, ſuitable for the Wound.

72. *Water for all ſorts of Wounds.*

Allom Water, Copperas Water, or Vitriol Water, or Lime Water, or Vinegar, or Chamber-lye, or Spirits of Wine, or Brandy, are very good to waſh all freſh Wounds; make them Milk warm when you make uſe of them.

73. *For old Ulcers and hot Furmations.*

Theſe are made of the Lees of Wine, or ſtrong Beer Emptying, and all manner of Herbs, as Rue, Mint, Burdock, Hemlocks, Plantain, Colts-foot, Dandelion Roots, Nettles, or any hot ſpirituous Herbs; boil them for two Hours, then take it off the Fire, and put in Spirits of Wine, or Camphire, and a good Piece of Soap, and uſe it almoſt boiling hot, for 'tis the Heat that puts a ſtop to a Mortification, and all Spirits and warm Things are good for all rotten Ulcers and hard Swellings; and for a Poultice, take Oatmeal, Milk, Bran, and Hog's Lard, which are very good for a running Wound, or hard Swelling. Take Nettles, or the Root ſtamped in a Mortar, then put them into old Barm, and the Whites of Eggs; then lay ſome hot Horſe-dung after you have laid on the Poultice, for the Heat of the Dung is a great Help to the Poultice, and will ſink it and bring it to a Head, ſo that you may open it with your Lancet.

74. *For all Cauſtick Remedies, the following is proper for old, ſtinking, rotten Ulcers.*

Such as Arſenick, Mercury, Vitriol, Copperas, Quickſilver, Oil of Vitriol, Oil of Spike, or any other cauſtick Remedies; you muſt take a great deal of Care in uſing theſe Remedies, for if they touch the Bone, you can make no Cure; but you muſt uſe a little at a time, and in forty-eight Hours you may ſee what Effect it takes; and then you may put on a little more; and to clean the Wound, and bring the Core quite out, you muſt dreſs it with Honey and Turpentine, and then lay on Burnt Allom and Verdigreaſe, and that will clear the Wound.

75. *An Ointment for the Eyes.*

Take one Handful of common Daſy-Roots, waſh them clean, and ſtamp them in a Mortar; then ſtrain the Juice through a clean Linnen Cloth, and put to the Juice an Ounce of Honey, and boil it over an eaſy Fire in an earthen Pipkin till it becomes like a Syrup, and keep ſkimming the droſſy Sulphur off, then take it off the Fire. This is an excellent Thing to clear the Sight, or to take off a Kell which obſtructs the Sight, anointing the Eye with a Feather. *Approved.*

Courteous Reader, I come now to a Concluſion of the whole Matter, and I hope it will not paſs for any Breach of Modeſty, to ſay, that the greateſt Part of my Life has been ſpent in ſtudying the beſt Methods I could, to promote the publick Benefit in my own Faculty, and the Succeſs has often been anſwerable to the Pleaſure I have taken in the Work.———Now you that will take the Pleaſure to read over this ſmall Treatiſe, and follow the Rules which I have given you, need not fear breeding of good Horſes and Mares, either for common Buſineſs or for Hunting; and I ſhould be glad if any Gentleman would once make a Trial of it, for then he would be very well ſatisfied in the Affair; and if this takes Effect, it is my Deſign to make ſome little Addition further concerning this Affair.—— If thoſe Men who are Maſters of Horſes would but once make a Trial of theſe Rules, they would ſoon find out the great Miſtakes that are made by thoſe Men who are not Maſters of their Buſineſs; and when thoſe Faults come to be amended, then your Pleaſure will be to ſee your Horſes in good Health and Proſperity; for what Creature is there in the World that is ſo handſome as a Horſe, when in his Prime? And when you have made Trial of this Treatiſe, you cannot but be ſenſible of the Errors which have been made; and theſe Rules muſt be your Guide for all thoſe that have but little Judgment in being a Groom, and have not the right Art of Riding, nor preſerving the Health; I ſay, for thoſe is this Treatiſe deſigned: And if any Accident ſhould happen, you have a Remedy carefully prepared, with as little Coſt as can be, and at laſt you will enjoy your Horſes with great Pleaſure, beſides the Benefit you will receive by them, which will requite you for all the Trouble you have been at. For my Part, I have had as much Pleaſure in doing Good, (that is, in penning this Book) as you that make uſe of it; and I heartily wiſh, that whoſe Hands ſoever this Book may light into, they may find the Benefit of it. For this I may ſay in my own Behalf, I have been very ſtudious in this Affair, to find out proper Methods for the breeding of good Horſes, *&c.* For what a Pity is it that ſuch a fine Creature as a Horſe is, ſhould be ſo much abuſed as they have been for ſome time paſt: And if I have committed any Miſtakes, I ſhould be glad to be made ſenſible of them, and take it as a Favour.

The End.

A Table, exhibiting at one View the Value of any Number of *Portugal* Pieces of Gold, in *Engliſh* Pounds, Shillings and Pence.

Num. of Pieces.	*Portugal* Pieces. at			at			at			at		
	3	12	0	1	16	0	0	18	0	1	7	0
	l.	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*
1	3	12	0	1	16	0		18	0	1	7	0
2	7	4	0	3	12	0	1	16	0	2	14	0
3	10	16	0	5	8	0	2	14	0	4	1	0
4	14	8	0	7	4	0	3	12	0	5	8	0
5	18	0	0	9	0	0	4	10	0	6	15	0
6	21	12	0	10	16	0	5	8	0	8	2	0
7	25	4	0	12	12	0	6	6	0	9	9	0
8	28	16	0	14	8	0	7	4	0	10	16	0
9	32	8	0	16	4	0	8	2	0	12	3	0
10	36	0	0	18	0	0	9	0	0	13	10	0
20	72	0	0	36	0	0	18	0	0	27	0	0
30	108	0	0	54	0	0	27	0	0	40	10	0
40	144	0	0	72	0	0	36	0	0	54	0	0
50	180	0	0	90	0	0	45	0	0	67	10	0
60	216	0	0	108	0	0	54	0	0	81	0	0
70	252	0	0	126	0	0	63	0	0	94	10	0
80	288	0	0	144	0	0	72	0	0	108	0	0
90	324	0	0	162	0	0	81	0	0	121	10	0
100	360	0	0	180	0	0	90	0	0	135	0	0
200	720	0	0	360	0	0	180	0	0	270	0	0
300	1080	0	0	540	0	0	270	0	0	405	0	0
400	1440	0	0	720	0	0	360	0	0	540	0	0
500	1800	0	0	900	0	0	450	0	0	675	0	0
600	2160	0	0	1080	0	0	540	0	0	810	0	0
700	2520	0	0	1260	0	0	630	0	0	945	0	0
800	2880	0	0	1440	0	0	720	0	0	1080	0	0
900	3240	0	0	1620	0	0	810	0	0	1215	0	0
1000	3600	0	0	1800	0	0	900	0	0	1350	0	0
5000	18000	0	0	9000	0	0	4500	0	0	6750	0	0
10000	36000	0	0	18000	0	0	9000	0	0	13500	0	0

30 65 MAY

A TABLE for Buying or Selling any Commodity by the Great Hundred, which is 112 Pounds.

d.	q.	l.	s.	d.	d.	q.	l.	s.	d.	d	q.	l.	s.	d.	d.	q	l.	s.	d.
0	0	0	0	0	6	0	2	16	0	12	0	5	12	0	18	0	8	8	0
	1	0	2	4		1	2	18	4		1	5	14	4		1	8	10	4
	2	0	4	8		2	3	0	8		2	5	16	8		2	8	12	8
	3	0	7	0		3	3	3	0		3	5	19	0		3	8	15	0
1	0	0	9	4	7	0	3	5	4	13	0	6	1	4	19	0	8	17	4
	1	0	11	8		1	3	7	8		1	6	3	8		1	8	19	8
	2	0	14	0		2	3	10	0		2	6	6	0		2	9	2	0
	3	0	16	4		3	3	12	4		3	6	8	4		3	9	4	4
2	0	0	18	8	8	0	3	14	8	14	0	6	10	8	20	0	9	6	8
	1	1	1	0		1	3	17	0		1	6	13	0		1	9	9	0
	2	1	3	4		2	3	19	4		2	6	15	4		2	9	11	4
	3	1	5	8		3	4	1	8		3	6	17	8		3	9	13	8
3	0	1	8	0	9	0	4	4	0	15	0	7	0	0	21	0	9	16	0
	1	1	10	4		1	4	6	4		1	7	2	4		1	9	18	4
	2	1	12	8		2	4	8	8		2	7	4	8		2	10	0	8
	3	1	15	0		3	4	11	0		3	7	7	0		3	10	3	0
4	0	1	17	4	10	0	4	13	4	16	0	7	9	4	22	0	10	5	4
	1	1	19	8		1	4	15	8		1	7	11	8		1	10	7	8
	2	2	2	0		2	4	18	0		2	7	14	0		2	10	10	0
	3	2	4	4		3	5	0	4		3	7	16	4		3	10	12	4
5	0	2	6	8	11	0	5	2	8	17	0	7	18	8	23	0	10	14	8
	1	2	9	0		1	5	5	0		1	8	1	0		1	10	17	0
	2	2	11	4		2	5	7	4		2	8	3	4		2	10	19	4
	3	2	13	8		3	5	9	8		3	8	5	8		3	11	1	8

EXAMPLE.

Firſt, at 5 *d.* 3 *q.* the Pound, what is the Great Hundred? Look in the Table for 5 *d.* 3 *q.* in the Firſt Column (being the Bottom Line) and againſt it in the Second, you ſhall find 2 *l.* 13 *s.* 8 *d.* and ſo will 112 Pound coſt. Again, if a Hundred Weight coſt 4 *l.* 8 *s.* 8 *d.* find 4 *l.* 8 *s.* 8 *d.* and againſt it, in the Column towards the Left Hand, there you ſhall find 9 *d.* 2 *q.* and ſo much it is by the Pound.

Note, For every Farthing that One Pound doth coſt, reckon Two Shillings and Four Pence, and that is the Price of the Great Hundred.

INTEREST at *Three per Cent.*

Principal.	*for One Day,*				*Thirty Days,*				*A Year,*			
	l.	*s.*	*d.*	*f.*	*l.*	*s.*	*d.*	*f.*	*l.*	*s.*	*d.*	*f.*
£ 1								2			7	
2							1			1	2	1
3							1	3		1	9	2
4							2	1		2	4	3
5							2	3		3		
6							3	2		3	7	
7							4			4	2	1
8							4	2		4	9	2
9							5	1		5	4	3
10							5	3		6		
20				1			11	3		12		
30				2		1	5	3		18		
40				3		1	11	2	1	4		
50				3		2	5	2	1	10		
60			1			2	11	1	1	16		
70			1	1		3	5	1	2	2		
80			1	2		3	11	1	2	8		
90			1	2		4	5		2	14		
100			1	3		4	11		3			
200			3	3		9	10	1	6			
300			5	3		14	9	2	9			
400			7	3		19	8	2	12			
500			9	3	1	4	7	3	15			
600			10	6	1	9	6	3	18			
700		1	1	3	1	14	6		21			
800		1	3	2	1	19	5	1	24			
900		1	5	3	2	4	4	1	27			
1000		1	7	2	2	9	3	3	30			
2000		3	3	1	4	18	7	2	60			
3000		4	11		7	7	11	1	90			
4000		6	6	3	9	17	3		120			
5000		8	2	2	12	6	6	3	150			
6000		9	10		14	15	10	2	180			
7000		11	5	3	17	5	2	1	210			
8000		13	1	2	19	14	6		240			
9000		14	9		22	3	9	3	270			
10000		16	5	1	24	13	1	3	300			

INTEREST at *Four per Cent.*

Principal.	*for One Day,*				*Thirty Days,*				*A Year,*			
	l.	*s.*	*d.*	*f.*	*l.*	*s.*	*d.*	*f.*	*l.*	*s.*	*d.*	*f.*
£ 1							3				9	2
2							1	2		1	7	
3							2	1		2	4	3
4							3			3	2	1
5							3	3		4		
6							4	2		4	9	2
7							5	2		5	7	
8							6	1		6	4	3
9							7			7	2	1
10				1			7	3		8		
20				2		1	3	1		16		
30				3		1	11	2	1	4		
40			1			2	7	2	1	12		
50			1	1		3	3	1	2			
60			1	2		3	10	4	2	8		
70			1	3		4	6	2	2	16		
80			2			5	2	3	3	4		
90			2	1		5	10	3	3	12		
100			2	2		6	6	3	4			
200			5	1		13	1	3	8			
300			7	3		19	8	2	12			
400			10	1	1	6	3	2	16			
500		1	1		1	12	10	2	20			
600		1	3	2	1	19	5	1	24			
700		1	6	2	2	6	0	1	28			
800		1	8	3	2	12	7		32			
900		1	11	2	2	19	2		36			
1000		2	2	1	3	5	9		40			
2000		4	4	2	6	11	6		80			
3000		6	6	3	9	17	3		120			
4000		8	9		13	3			160			
5000		10	11	2	16	8	9		200			
6000		13	1	2	19	14	6		240			
7000		15	3	3	23	0	3		280			
8000		17	6		26	6			320			
9000		19	8	3	29	11	9		360			
10000	1	1	11		32	17	6	1	400			

INTEREST at *Five per Cent.*

Principal.	*for One Day,*				*Thirty Days.*				*A Year,*			
	l.	*s.*	*d.*	*f.*	*l.*	*s.*	*d.*	*f.*	*l.*	*s.*	*d.*	*f.*
£ 1								3		1		
2							1	3		2		
3							2	3		3		
4							3	3		4		
5							4	3		5		
6							5	3		6		
7							6	3		7		
8				1			7	3		8		
9				1			8	3		9		
10				1			9	3		10		
20				2		1	7	2	1			
30				3		2	5	2	1	10		
40			1	1		3	3	1	2			
50			1	2		4	1	1	2	10		
60			1	3		4	11		3			
70			[illegible]	[illegible]		5	8	3	3	10		
80			2	1		6	6	3	4			
90			2	3		7	4	2	4	10		
100			3	1		8	2	2	5			
200			6	2		16	5	1	10			
300			9	3	1	4	7	3	15			
400		1	1		1	12	10	2	20			
500		1	4	[illegible]	2	1	1		25			
600		1	7	2	2	9	3	2	30			
700		[illegible]	10	[illegible]	2	17	6	1	35			
800			1		3	5	8	3	40			
900			5	1	3	13	11	2	45			
1000			8	3	4	2	2	1	50			
2000				3	8	4	4	2	100			
3000				2	12	6	6	3	150			
4000		[illegible]		2	16	8	9		200			
5000		13	[illegible]	1	20	10	11	2	250			
6000		16	5		24	13	1	3	300			
7000		19	2		28	15	5		350			
8000	1	1	10	3	32	17	6	1	400			
9000	1	4	7	[illegible]	36	19	8	2	450			
		[illegible]	4	3	41	1	11		500			

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